

Plastic Monofilament Extrusion Instruction Manual

圆丝拉丝机操作指南

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Foreword 前言

Thanks for buying our machine. Please read the Instruction Manual before operating. The machine may go out of control and its time span will be shortened because of improper use.

感谢您购买我们的机器。请在操作前阅读使用说明书。操作不当可能会损坏设备，缩短设备使用寿命。

Security Considerations

安全注意事项

The operators in charge of the installation, circuit interconnection, operation, inspection, etc. must be experts who are familiar with the machines and security considerations.

负责设备安装、接线、运行、检查等操作的人员必须先熟悉机器和安全注意事项。

☆Statement☆

声明

The buyer is requested to come to seller's factory for testing the machine before its delivery. The machine should be only delivered after the buyer is satisfied. 要求买方在交货前到卖方工厂对机器进行测试。机器只能在买方满意后交付。

If the buyer can't come and test the machine in seller's factory, the seller will test the machine by themselves and send the video of the testing process to customer. The machine should be delivered after the buyer is satisfied with the machine according to the video. 如果买方不能来卖方工厂测试机器，卖方将自行测试机器并将测试过程的视频发送给客户。根据视频，买方对机器满意后，应交付机器。

The buyer must inspect the machine carefully after receiving it, including the surface, quantity of parts, etc. For any problem, the buyer must inform the seller at the date of opening the container. Problem of part broken or missing shall be solved by negotiation among the seller, buyer and the shipping company. 买方在收到机器后必须仔细检查机器，包括表面、零件数量等。对于任何问题，买方必须在打开集装箱之日通知卖方。零件损坏或丢失的问题应由卖方，买方和运输公司协商解决。

If the buyer request for technician service, he must wait for the technician come to test and operate the machine. The buyer is not allowed to test the machine by themselves. 如果买方要求技术人员到买方国家提供技术支持，他必须等待技术人员到达后再测试和操作机器。买方不得自行测试机器。

If technician service is not requested, the buyer should let the local experienced technician to install and test the machine. The technician should have operated the same machine before. Technician from seller's company will provide training by video or phone call to the local technician. The local technician can only test the machine after carefully reading the instruction and receiving the training from the seller part. 如果买方不要求技术人员到买方厂里提供技术支持，买方应让当地经验丰富的技术人员安装和测试机器。技术人员须有同种机器的操作经验。卖方公司的技术人员将通过视频或电话向当地技术人员提供培训。当地技术人员只有在仔细阅读说明并接受卖方部分的培训后才能测试机器。

If the buyer doesn't do accordingly, he will be responsible for any problem result from operational errors. 如果买家没有这样做，他将对操作错误导致的任何问题负责。

I. Installation 安装

I. I Site Requirements 场地要求

Mold 型号	Size 场地面积	
SYP(T)-M65	≥20m×4m×4m	
SYP(T)-M80	≥20m×4.1m×4.1m	
SYP(T)-M90	≥22m×4.2m×4.2m	√

II. Operation 操作

II. I Preparation 准备工作

- ① Lubricant inspection: Inspect lubricant in the gearbox and filter, replace, or add lubricant accordingly. 润滑油检查: 检查变速箱中的润滑油, 并相应地过滤、更换或添加润滑油
- ② Clear all lubricative parts. 清除所有润滑部件。
- ③ Inspect the joint bolts of all parts and tight them when needed. 检查所有零件的接头螺栓, 并在需要时拧紧。
- ④ Dust clearing: remove the dusts from the containers; 除尘: 清除容器中的粉尘;
- ⑤ Line inspection: check whether it is fastened. 线路检查: 检查是否紧固。
- ⑥ Power transmission inspection: check electromotor, electric heater unit and electrical control unit and see whether all insulation resistance of motor, meets the related regulation. 输电检查: 检查电动机、电加热器单元和电气控制单元, 查看电机的所有绝缘电阻是否符合相关规定。
- ⑦ Pipeline inspection: check and avoid leak of the water, gas and oil pipes. 管道检查: 检查并避免水、气、油管道泄漏。

II. II Production Flow 生产流程

II. II. I Operating Steps 操作步骤

- ① Open the main power. 打开主电源。
- ② Turn on the switch and ensure power light turns green and temperature control instrument, ammeter, rotate indicating instrument, manometer and governor control are electrified. 打开开关, 确保电源指示灯变为绿色, 温度控制仪表、电流表、旋转指示仪表、压力计和调速器控制通电。
- ③ Open screen exchanger and add filter screen: no less than 2 pieces of 60 mash and 1 pieces of 80 mash (How many screens needed is determined by the condition. 打开换网器并添加过滤网: 至少 2 片 60 目和 1 片 80 目 (需要多少过滤网取决于生产条件)

④ Heating: heat the mold, screen exchanger and screw. The temperature is set as following: 加热: 加热模具、换网器和螺杆。温度设置如下:

Material 材料	模具 Mold	Screen Exchanger 换网器	Screw 螺杆				Extension part 延伸部分	
			1#	2#	3#	4#	1#	2#
PP 聚丙烯	200 (°C)	200 (°C)	180 (°C)	200 (°C)	200 (°C)	200 (°C)	100 (°C) -For hot water tank 130 (°C) -for oven 热水箱 100°C/ 烘箱 130 (°C)	
PE 聚乙烯	210 (°C)	210 (°C)	190 (°C)	210 (°C)	210 (°C)	210 (°C)		
PET 聚酯 /PA 尼龙	240 (°C)	240 (°C)	220 (°C)	240 (°C)	240 (°C)	240 (°C)		

Time for heating: screen exchanger, T-junction (if there is), melt pump (if there is), and mold must be heated over 3 hours; screw over 2 hours; extension part over 1.5 hours. Cooling water should be set at 30-50 degree centigrade. The distance between water surface and mold shall be about 1-2cm.

加热时间: 换网器、三通 (如有)、熔体泵 (如有)、模具必须加热 3 小时以上; 螺杆加热 2 小时以上; 延伸部分加热 1.5 小时以上。冷却水应为 30-50 摄氏度。水面高度距离模具 1-2cm.

Sequence of heating: Mold and screen exchanger should be heated first for 1.5 hours then fuselage and extension part. The temperature should be set at 10 degree centigrade higher than standard then set back to standard level after running the machine. 加热顺序: 模具和换网器应先加热 1.5 小时, 然后加热机身和延伸部分。加热时温度应设置为比标准温度高 10 摄氏度, 在运行机器后调整回标准温度。

For PET and PA material, the raw material need to be heated for about 4 hours in the drying mixer at about 130°C. And the temperature of hopper on top of extruder need to be

set at 120°C for the PET and PA extrusion line when it working. The PET flake size shall be smaller than 2cm*2cm.

对于聚酯（PET）和尼龙（PA）材料，原料应在预结晶中加热 4 小时，温度约 130 摄氏度，PET PA 挤出机主机上方的加热料斗在机器运转时温度设置 120 摄氏度。PET 片料尺寸应小于 2cm*2cm.

- ⑤ Inspect and ensure that the machine is filled with primary materials. The machine will be running with the electromotor start to work. First look at the forward and reverse rotation of the motor, if it is reversed, immediately adjust the wiring to avoid the screw from leaving the reducer. The motor startup and filling of primary materials should be started slowly. Rotating speed should be under 10 rotations per minutes. It should be turned to normal speed slowly after output and ammeter is regular.

检查并确保机器已经填充原料。打开主电机，机器开始运行。先看电机正反转，如果反转，立马调整接线，避免螺杆脱离减速机。初始转速应设置低于每分钟 10 转。当有原料挤出且电流表正常后，缓慢调到正常速度。

- ⑥ The electric current should be set not over 50Hz (Some special countries excepted) for machine protection. 电流应设置为不超过 50Hz（某些特殊国家除外），以保护机器。

Fill the machine with primary material. How many materials needed should be decided by rotating speed of speed controller. 添加主料。需要多少原料应由速度控制器的转速决定。

Adjust the rotating rate of winding device according to technological requirements.

Qualified products will be wind. . 根据工艺要求调整收卷装置的转速。

- ⑦ About oil adding for gear box (reducer):减速机加油

Oil type : gear oil 种类： 齿轮油

Gear Box Model 减速机型号	Oil (L) 油/L
146 Model	About 10L
173 Model	About 12L
200 Model	About 28L
225 Model	About 33L
250 Model	About 46L
Note: When there is a sight glass to see the oil level, the oil surface shall be cover the middle (1/2) of the sight glass. 注：当减速机上有油镜（观察孔），油面应该达到观察孔的 1/2 位置处。	

2. Stop Machine from Working 停止设备运行

- ① Close the flashboard of the hopper when you want to stop the machine from working.

This will make less material left within the screws, that is important especially for PET and PA extrusion. The engine should be slowdown then stop. If power cut suddenly, cut off all power sources. 当您想停止机器工作时，关闭料斗的闪板。这将使螺杆内残留的材料更少，尤其是 pet 和 pa 材料，减少残留更重要。发动机应减速然后停止。如果突然断电，请切断所有电源。

- ② Stop the motors. 关闭电机。

- ③ Stop heating. 关闭加热系统。

II. III Fault Handling 故障处理

When it suddenly powers off or metallic foreign body goes into machine barrel by mistakes, the screws will stop suddenly. When things like that happens, following contingency measures need to be done: 当突然断电或金属异物误入螺筒时，螺杆会突然停止。当这样的事情发生时，需要采取以下应急措施：

Turn off the power switch of all electromotor, electrical heating and feed system. All controlling button should be turned back to initial position. 关闭所有电动机、电加热和喂料系统的电源开关。所有控制按钮应转回初始位置。

- ① If the screws stop to work with metallic foreign body going into machine barrel, shaping mold need to be dismantled. Pull out the screws and clean the molds, machine barrel, and screws. After cleaning of fault, screws and shaping molds should be installed.

Production will be able to resume when reheated. 如果金属异物进入螺筒导致螺杆停止工作，拆除模具。拔出螺杆并清洁模具、螺筒和螺杆。清洁后重新安装螺杆和模具，重新加热后恢复生产。

- ② If the screws stop to work with sudden power off, turn off the power switch of all electromotor, electrical heating and feed system. All controlling button should be turned back to initial position. 如果螺杆因突然断电而停止工作，请关闭所有电动机、电加热和进料系统的电源开关。所有控制按钮应转回初始位置。

II. IV Attention 注意事项

- ① Machine barrel and hopper need to be carefully checked to see if there is any foreign body before extruder start to working. Sundries and oil stain need to be cleared in time. If abnormal sounds or disbalance occurs with some unknown reasons during machine working, stop the machine from working and let some experts check and solve the problem. Maintenance should be done when the machines is not working. 挤出机开始工作前，需要仔细检查螺筒和料斗是否有异物。杂物和油渍需要及时清除。如果在机器工作过程中由于一些未知原因出现异常声音或抖动，请停止机器，让技术人员检查并解决问题。机器不工作时应进行维护。

Don't touch the working machines and parts. Don't thump parts with heavy punch when install or dismantle screws and mold. Hardwood can be used for buffering. 请勿触摸工作机器和零件。在安装或拆卸螺杆和模具时，不要用重拳重击零件。可用硬木作为缓冲。

- ② Screws are not allowed to rotate within machine barrel for over 3 minutes when there is

no material in machine barrel. 螺筒内无原料时，螺杆不允许在螺筒内旋转超过 3 分钟。

- ③ Operators should not stand with their face forward to machine barrel or mold during problem solving avoid getting hurt. 操作人员在解决问题过程中不应将脸朝向螺筒或模具站立，以免受伤。

Even if the extruder works normally, ammeter pointer of main electromotor need to be observed now and then. 即使挤出机正常工作，也需要时不时地观察主电动机的电流表指针。

- ④ When to clean the machine barrel, screws and mold, you can use cutters made of bamboo or copper but not steel. Fire cannot be used either. 清洁机筒、螺杆和模具时，可以使用竹子或铜制的刀具，但不能使用钢制的刀具。也不能用火。

- ⑤ Operators should not leave or do other work when extruder is working. If he must go, he need to stop the machine or find another caretaker. 挤出机工作时，操作人员不应离开或做其他工作。如果他必须离开，他需要停止机器或找其他人代为看护。

- ⑥ Untrained person cannot do operation independently. 未经培训的人员不能独立操作。

- ⑦ If the cleaned screws are not used temporarily, smear some slushing oil then pack it and hang it vertically in a dry and windy place. 螺杆清洁后如果暂时不使用，请涂抹一些防锈油，然后将其包装好，垂直悬挂在干燥多风的地方。

- ⑧ If the extruder will be set aside for long time, surface of shaping molds should be smeared with slushing oil. Feeding holes need to be covered. Don't put heavy things on machine barrel and molds. 如果挤出机长时间搁置，成型模具表面应涂抹防锈油。遮盖喂料孔。不要把重物放在机筒和模具上。

III Maintenance 保养

Maintenance of extruder includes daily and time-based (monthly, quarterly and yearly) maintenance. 挤出机的维护包括日常维护和定期（每月、每季度和每年）维护。

Daily maintenance is daily checking by operator of each rotation, including oil application, nut fasten, equipment cleaning, ect. These are also described in extruder operation regulation. Therefore, operators' observance of the regulation is also a protection to the equipment. 日常维护是操作员每次开机前的日常检查，包括涂油、螺母紧固、设备清洁等。这些也在挤出机操作规范中有所描述。因此，操作员遵守操作规范也是对设备的保护。

III. I: Main Points for Daily Maintenance. 日常保养要点

Attention: 注意事项

- ① If abnormal sounds or disbalance occurs, push stop button immediately. 如果出现异常声音或抖动, 请立即按下停止按钮。
- ② When there are faults, make repairman noted and turn all buttons of main motor and filling machine speed control button back to initial position. 当出现故障时, 注意将主电机和送料机速度控制按钮的所有按钮转回初始位置。
- ③ Pay close attention to main motor current and voltage when speeding and feeding more. Avoid overpower and overpressure. 加速和上料时, 要密切注意主机电流和电压。避免电流和电压过大。
- ④ Speed-control buttons of main generator and auxiliary machinery need to be turn back to initial position during suspension. 设备停置时, 主发电机和辅助机械的调速按钮需要转回初始位置。
- ⑤ Operators should not leave or do other work when extruder is working. If he must go, he need to stop the machine or find another caretaker. 挤出机工作时, 操作员不应离开或做其他工作。如果他必须离开, 他需要停止机器或找到另一个看护人。
- ⑥ Start, stop or emergency stop must be operated according to regulation. 启动、停止或紧急停止必须按规定操作。

Maintenance 保养

① Daily Maintenance. 日常保养

Maintenance Parts 保养部件	Frequency 频率	Method of Maintenance 保养方式
Machine Cleaning	Once a day	Clean the surface of the mainframe and distribution cabinet.

设备清理	每日一次	清洁主机和配电柜的表面。
Valve 阀门	Once a day 每日一次	Regulate the valve to make the air flows unobstructed 调节阀门，使气流畅通无阻
Lubricant & Oil Level 润滑油/油位	Twice a day 每日两次	Confirm that lubricating oil pump work normally. No leaking! Oil level should be at the 2 third of the oil tank. 确认润滑油泵工作正常。 确认不漏油！ 油位应为油箱的 2/3。
Cooling Trough 冷却槽	Once a day 每日一次	Leaky? 是否漏水？
Heating Element 加热部件	Twice a day 每日两次	Confirm it emit heat normally and the temperature is at normal level. 确认散热正常，确认温度处于正常水平。
Heating Element 加热部件	Twice a day 每日两次	Confirm it emit heat normally and the temperature is at normal level. 确认散热正常，确认温度处于正常水平。

② Time-based (monthly, quarterly and yearly) Maintenance. 定期（每月、每季度和每年）

维护

Items	Frequency	Method of Maintenance
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项目	频率	保养方式
Distribution Cabinet 配电柜	Once a month 每月一次	Clean the dust inside with vacuum. 用真空吸尘器清洁配电柜内部灰尘。
Terminal 螺丝	Once a month 每月一次	Fasten all screws and nuts 禁锢螺丝
Gear-Oil Replace 齿轮油更换	Twice a year 每年两次	Close the main power and clean the oil tank then refill the tank. 关闭主电源并清洁油箱，然后重新注油。

IV: Fault Analysis 故障分析

I. Electromotor cannot be started 电动机无法启动

- ① Switch is open or circuit is burn-out. 开关断开或电路烧坏。
- ② Wire is broken somewhere or poor contact between joints. 某处电线断裂或接头接触不良。
- ③ Control button are not turned to initial position. 控制按钮未转到初始位置。
- ④ Operation mistake. 操作失误。

II. Instable or over-high Current II. 电流不稳或过高

- ① Machine barrel is fed unevenly. 螺筒进料不均匀。
- ② Constant-temperature heating to machine barrel is not long enough. 恒温加热螺筒时间不够长。
- ③ Heating temperature to machine barrel is not constant. 螺筒的加热温度不是恒定的。
- ④ Bearing of main electromotor has been worn to serious. 主电动机轴承磨损严重。

III. Main electromotor works but screws don't rotate. 主电动机工作，但

螺杆不转

- ① Securing pin in the transfer motion system is broken. 传输运动系统中的固定销断裂。
- ② Constant-temperature heating to machine barrel is not long enough. 恒温加热螺筒时间不够长。
- ③ The V-shaped belt is over worn lead to driving wheel idling conditions. V 型皮带过度磨损导致驱动轮空转情况。
- ④ Some transfer motion button doesn't work. 某些传动按钮不工作。
- ⑤ Some metallic foreign body block the screws make it unable to rotate. 一些金属异物堵塞了螺杆，使其无法旋转。
- ⑥ Tooth of driver gear is broken and make the gear jammed. 驱动齿轮齿断裂，使齿轮卡住。

IV. The screws rotate unstably 螺杆旋转不稳

- ① Centre-to-centre distance of V shaped belt wheel is too short or V shaped belt installed loosely result that it slips when works. V 型皮带轮中心到中心距离太短或 V 型皮带安装松散导致工作时打滑。
- ② Speed control system of the electromotor has some faulty and be not able to perform well. 电动机的速度控制系统存在一些故障，不能很好地工作。
- ③ Heating temperature of machine barrel is not constant, making plasticizing temperature not stable in the machine barrel. 螺筒加热温度不恒定，使螺筒内的塑化温度不稳定。

V. Screw rotates stably but extruding rate is not stable. 螺杆旋转稳定，挤出速度不稳定。

- a) Raw material in machine barrel comes discontinuously. 螺筒中进料不连续
- b) Net-changing place is jammed by sundries. 换网位置被杂物堵塞。
- c) The feeding part of the screw didn't reach the temperature needed resulting that the materials stick to the flank of thread obstructing feeding. c) 螺杆的给料部分未到所需的温度，导致原料粘在螺纹的侧面阻碍进料。
- d) Heating temperature of machine barrel is not constant, making molten material flow unstably. 螺筒加热温度不恒定，使熔融物料流动不稳定。

VI. The screw rotate with abnormal sound. 螺杆旋转声音异常。

- a) The screw is frictional with machine barrel. 螺杆与螺筒摩擦。
- b) The plasticizing material is mixed with metallic foreign body. 塑化材料中混入了金属异物。
- c) The plasticizing material is of low temperature making the screws overwork. 原料的塑化低，使螺杆负荷过大。

- d) Joint bolt between machine barrel and machine base is stretched out of shape and transplacement occurs. 螺筒和机座之间的接头螺栓拉伸变形并发生移位。
- e) Net-changing machine is out of shape or jammed with foreign mater. 换网器变形或被异物卡住。

VII. Machine barrel temperature is fluctuant and uncontrollable. 螺筒温度波动不定

- a) Bad contact between thermocouple and temperature part. 热电偶接触不良。
- b) Electric heater is not fully contacted with Machine barrel. 电加热器未与螺筒完全接触
- c) Joint bolt of resistance wire in the electric heater is not fastened. 电加热器中电阻丝的接头螺栓未紧固。
- d) Temperature controller doesn't perform normally. 温度控制器无法正常工作

VIII. Temperature of drive bearing is over high 驱动轴承温度过高

- a) Bearing is lack of lubricant. 轴承缺润滑剂。
- b) Foreign body on drive shaft 驱动轴混入异物。
- c) Ball bearing is over worn or ball stand is broken. 滚珠轴承过度磨损或滚珠支架损坏。

IX. Extruder makes noise 挤出机发出噪音

- a) Fan blade scrapes its shade. 风扇叶片刮擦风扇罩。
- b) V shaped belt wheel installed wrong lead to V belt move unevenly. V 型皮带轮安装错误导致 V 型皮带移动不均匀。
- c) Lubricant between gears is not enough lead to dry friction. 齿轮之间的润滑剂不足导致干摩擦。
- d) Foreign body on drive shaft. 驱动轴混入异物。
- e) Rolling bearing is over worn. 滚动轴承过度磨损。
- f) The screw is frictional with machine barrel. 螺杆与螺筒摩擦。