2020

PE450三层共挤管材生产线使用维护手册

PE450 three layers pipe Co-extrusion line maintenance manual book

JWELL

苏州金纬机械制造有限公司

2020/10/31

V1.0

苏州金纬机械制造有限公司
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Content

一、使用和性能 Use and Performance

1.1、使用范围 Scope of use

PE/MPP管材挤出生产线是加工 PE/ PP粒料的生产线，本说明书所讲的操作和使用规程只适用于加工 PE/PP粒料。如果使用者自行加工其它物料，则不在本说明书指导的范围之内，同时，由此产生的不良后果由使用方自行承担，本公司将不承担任何责任。

The PE/MPP pipe extrusion line is a production line for processing PE/PP pellets. The operation and use procedures described in this manual are only applicable to processing PE/PP pellets. If the user processes other materials on his own, it is not within the scope of this manual. At the same time, the user shall bear the adverse consequences arising therefrom, and the company will not bear any responsibility.

1.2、性能 Performance

PE/MPP管材挤出生产线最终产品，管材最大外径Φ450mm，管径范围为Φ110mm—Φ450mm，壁厚最大为δ=28.6mm。相应规格的壁厚根据国家标准实施，最大产量：1100-1300kg/h（PE）。

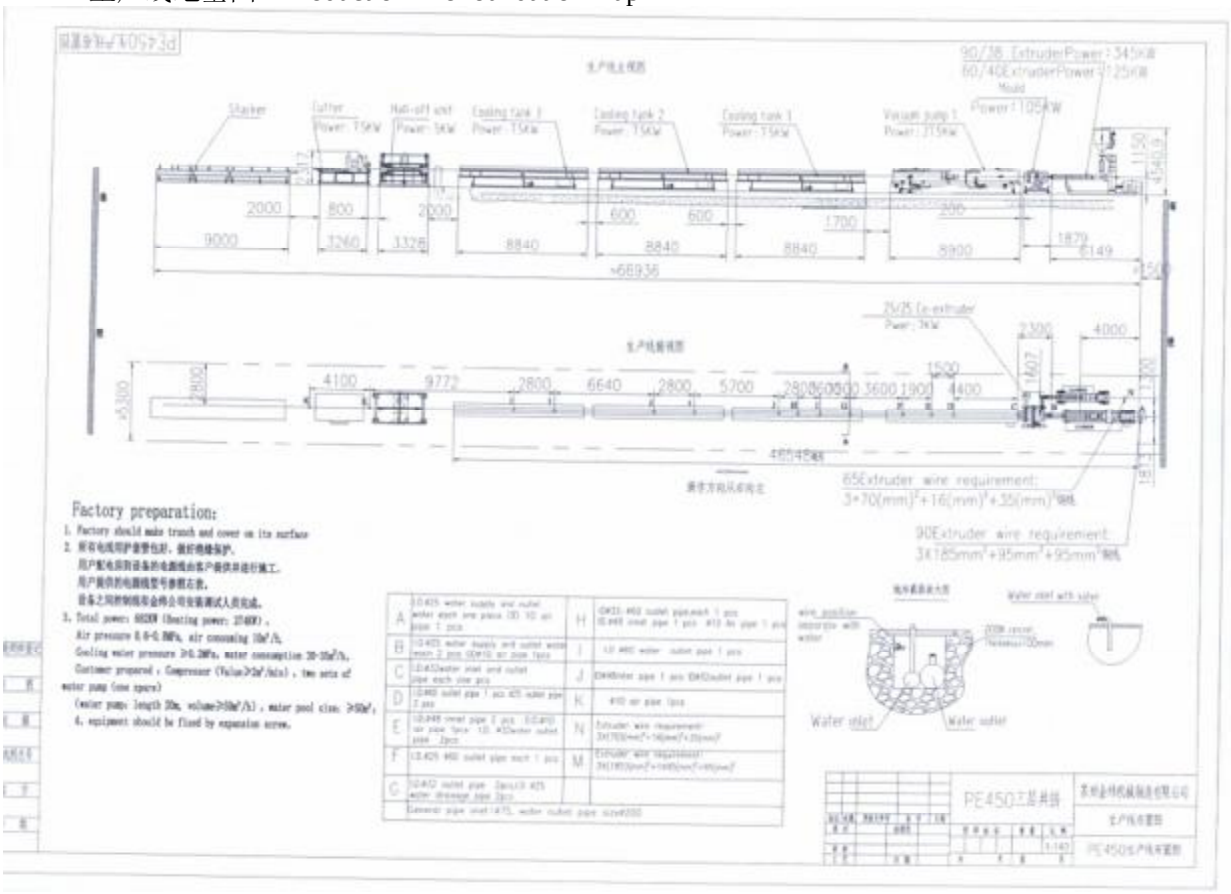
The final product of the PE/MPP pipe extrusion line, the maximum outer diameter of the pipe is Φ450mm, the pipe diameter ranges from Φ110mm—Φ450mm, and the maximum wall thickness is δ=28.6mm. The wall thickness of the corresponding specifications is implemented according to national standards, and the maximum output: 1100-1300kg/h (PE).

1.3、PE/MPP 管材挤出生产线工作与储运的环境要求 PE/MPP Pipe Extrusion Production line working and environmental requirement

允许环境空气温度：+5℃～40℃；
储运温度：-20℃～55℃；
相对湿度：至 90%，无凝露；
污染等级：2 级，不应安装在多粉尘,有腐蚀性气体的场所；
海拔高度：<1000 米，>1000 米须降容使用，每升高 100 米，负载能力降 1%
Allow ambient air temperature: +5 ° C ~ 40 ° C;
Storage and transportation temperature: -20 ° C ~ 55 ° C; Relative humidity: up to 90%, no condensation;
Pollution degree: Class 2, should not be installed in places with excessive dust and corrosive gases;
Altitude: <1000 meters, >1000 meters for derating, for every 100 meters, the load capacity is reduced by 1%

1.4、地基 Foundation

生产线地基图。Production line foundation map



1.5、电源要求 Power requirement

供电系统形式：三相五线制，即TN-S系统 （3P/N/PE）

三相电压：380V±10% 单相电压：220V±10% 电源频率：50HZ

Power supply system form: three-phase five-wire system, ie TN-S system (3P/N/PE)
Three-phase voltage: 380V ± 10% Single-phase voltage: 220V ± 10%
Power frequency: 50HZ

1.6、进线电缆要求 Incoming cable requirements

要求用户厂房配备设备电源柜，用户设备电源柜到生产线电柜的进线电缆规格：电源要求:(三相五线制）

The user’s plant is required to be equipped with an equipment power cabinet, and the specifications of the incoming cable from the user’s equipment power cabinet to the production line electrical cabinet: Power requirements: (three-phase five-wire system)

- 185*3+95+95（L*3+N+PE）mm² 铜线（90/38主机）
- 70*3+16+35（L*3+N+PE）mm² 铜线（60/40主机）
- 本生产线建议变压器容量为500KVA

电源要有接地保护线，电气控制柜附近要预埋接地电阻 R≤4Ω

185*3+95+95 (L*3+N+PE) mm² copper wire (90/38Extruder)

70*3+16+35 (L*3+N+PE) mm² copper wire (60/40Extruder)

The recommended transformer capacity of this production line is 500KVA.

The power supply must have a grounding protection line, and the grounding resistance

must be embedded near the electrical control cabinet R≤4Ω

1.7、气源要求 Air source requirement

气源压力 0.6～0.8MPa，正常工作时耗气量约 0.8m³/min。

The air source pressure is 0.6-0.8 MPa, and the air consumption during normal operation is about 0.8 m³/min.

1.8、水源要求 Water source requirement

生产线工作时总耗水量约 25 m³/h。压力 0.4～0.6MPa,正常水温＜35℃,需配备大水池或冷却塔，总进水管口径 63mm，并在进口处安装球阀一个，总出水管为口径 160mm水管。

The total water consumption during the production line is about 25 m³/h. pressure 0.4 ~ 0.6MPa, normal water temperature <35 ° C, need to be equipped with a large pool or cooling tower, the total inlet pipe diameter 63mm, and install ball valve at the entrance One, the total outlet pipe is a 160mm waterpipe.

二、PE/MPP 管材挤出生产线构成及工艺流程 PE/MPP Pipe extrusion line composition and technical process

2.1、生产线构成及各部分功能（生产线总布置见附图 1）Production line consist and each part function (General production line layout drawing see attached)

生产线主要由以下部分组成，具体如下图所示：

The mechanical part of the production line is mainly composed of the following parts, as shown in the following figure:

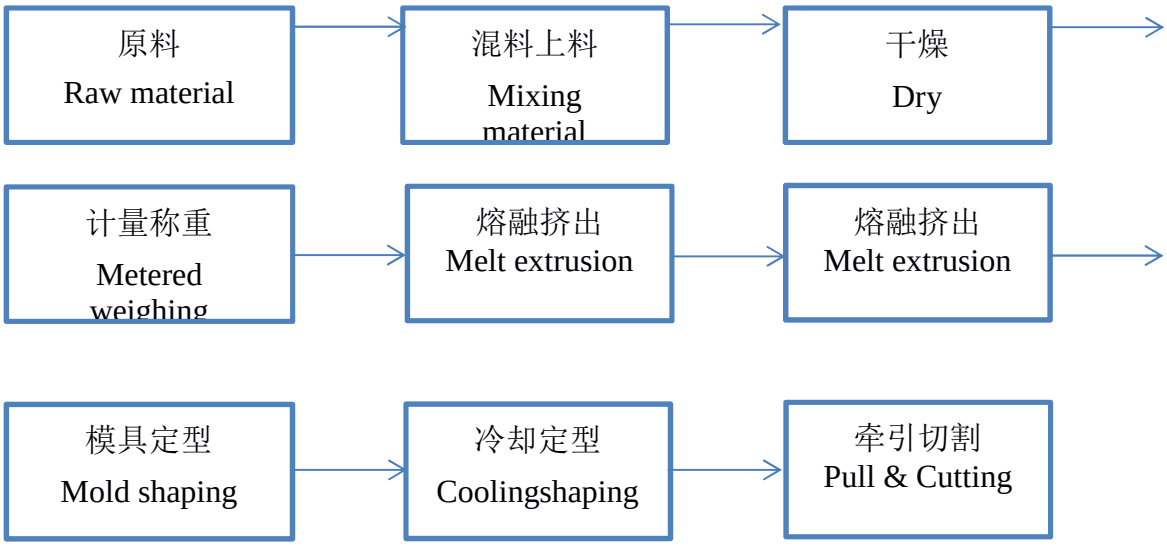
上料干燥系统 Feeder System	2套 2set
米重控制系统Meter weight control system	2套 2set
JWS90/38挤出机及JWS25/25色标线共挤机	各1台
JWS90/38 extruder and JWS25/25 color line co-extrusion machine	each 1 set
JWS60/40挤出机 JWS60/40 extruder	1台 1set
液压换网单元 Hydraulic Screen Changer	0套 1set
PE/MPP 450挤出模具 Pipe Mold	1套 1set
PE/MPP 450真空箱Vacuum Tank	2台 2set
PE/MPP 450喷淋箱Cooling Tank	3台 3sets
六爪牵引机Haul-off Unit	1台 1set
PE/MPP 450圆刀无屑切割机 No-dust Cutter	1台 1set
PE/MPP 450翻料机 Stacker	1台 1set
电气控制系统 Electric control system	1套 1set

生产线各部分主要功能Main functions of each part of the production line：

- 上料干燥系统Loading drying system：
  给挤出机及时供应原料，并进行烘干Supply raw materials to the extruder in time and conduct drying
- 米重控制系统Meter weight control system：
  精准控制物料的供给，保证螺杆吃料量的稳定。Precisely control the supply of materials to ensure the stability of the screw feed.
- 挤出机Extruder：
  JWS90/38单螺杆挤出机和JWS60/38单螺杆挤出机主要作用是对加工物料进行输送、熔融和均化挤出。JWS25/25单螺杆挤出机的主要作用是均匀挤出色标线所需物料。
  The main function of JWS90/38 & JWS60/40 single screw extruder is to convey, melt and homogenize extrusion of processed materials. The main function of the JWS25/25 single screw extruder is to evenly extrude the materials required for the color marking.
- 液压换网装置Hydraulic Screen Changer：
  通过液压装置进行快速更换过滤网Quick change of filter screen by hydraulic device。
- 挤出模具Pipe Mold：
  对熔融的物料进行成型挤出Form extrusion of molten materials。
- 真空箱Vacuum Tank：
  对模具挤出的管材进行真空定型冷却Vacuum shaping and cooling of the pipe extruded from the mold
- 喷淋箱Cooling Tank：对管材进行冷却Cool the pipe

- 牵引机Haul-off unit：对管材进行牵引Tractor the pipe
- 切割机Cutter：对管材进行定长切割Cut the pipe to length
- 翻料架Stacker：将定长切割的管材成品暂时存储Temporarily store the finished pipe cut to length
- 电气控制系统Electric Control System：
  对生产线的各个工作部分进行控制。电气部分采用人机界面，PLC，变频器和伺服等控制。主机与辅机即可独立控制，又可以在主机上控制共挤机，牵引机等辅机；具有强大功能和完善的故障报警系统。最新的控制系统还配备云平台，具有口袋工厂的功能，在手机上也可以实时的访问控制系统，实时远程查看生产状态和维护生产线的正常运行。Control each part of the production line. The electrical part adopts man-machine interface, PLC, inverter and servo control. The main engine and auxiliary equipment can be controlled independently, and the auxiliary equipment such as co-extrusion machine and tractor can be controlled on the main engine; it has powerful functions and a complete fault alarm system. The latest control system is also equipped with a cloud platform, which has the function of a pocket factory. You can also access the control system in real time on your mobile phone to remotely view the production status and maintain the normal operation of the production line in real time.

2.2、生产线工艺流程 Production line technical process



三、挤出单元基本参数及安全操作指导 Extrusion unit basic parameters and safety instruction

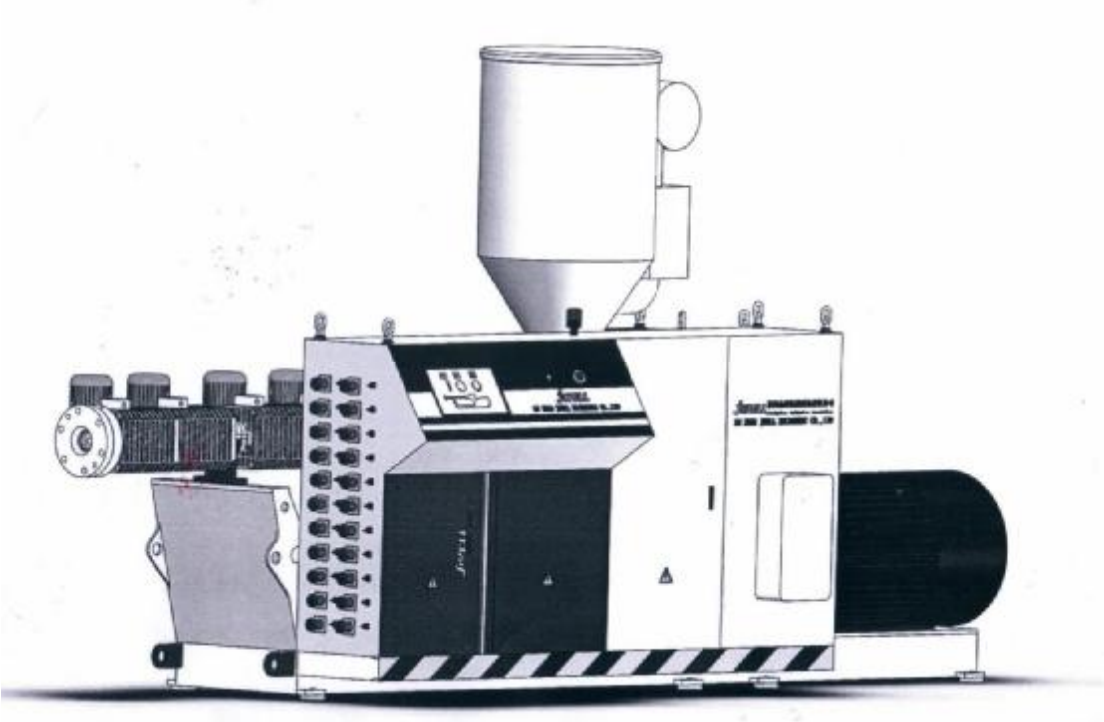
3.1、挤出单元基本参数及安全操作指导 Extrusion unit basic parameters and safety instruction

3.1.1、挤出机基本参数 Extruder basic parameters

挤出机型号：JWS90/38	Extruder type：JWS90/38
螺杆直径： 90mm	Screw diameter:90mm
长径比： 38:1	Length to diameter ratio:38:1
主电机功率：AC250KW	Driving power: AC250KW
加热方式： 陶瓷加热	Heating method: Ceramic heating
加热功率： 36KW	Heating power:36kW
加热区数： 6区	Heating section:6
冷却方式： 风机冷却	Cooling method: fan cooling

挤出机型号：JWS60/40	Extruder type：JWS60/40
螺杆直径： 60mm	Screw diameter:60mm
长径比： 40:1	Length to diameter ratio:40:1
主电机功率：AC90KW	Driving power: AC90KW
加热方式： 陶瓷加热	Heating method: Ceramic heating
加热功率： 18KW	Heating power:18kW
加热区数： 6区	Heating section:6
冷却方式： 风机冷却	Cooling method: fan cooling

挤出机外形图如下：The outline drawing of the extruder is as follows:



3.1.2、挤出机的吊装 Lifting of the extruder

挤出机在吊装前，先将有足够强度的圆钢插入机架吊装孔，根据吊装示意图，起吊挤出机。由于挤出机重量分布不平衡会导致搬运过程中的中心偏移，为防止吊索在吊钩中滑动，套在吊钩中的吊索必须在吊钩上多绕一圈。在吊装过程中,请稳住机器的中心，防止机器吊装过程中在空中摆动幅度太大，伤及操作者或现场其他相关人员。

Before the hoisting machine, insert the round steel with sufficient strength into the rack lifting hole, and lift the extruder according to the lifting diagram. Due to the imbalance of the weight distribution of the extruder, the center deviation during the handling process will be caused. To prevent the sling from sliding in the hook, the sling that is placed in the hook must be wound more on the hook. During the hoisting process, please stabilize the center of the machine to prevent the swing in the air during the hoisting process from being too large, which may damage the operator or other relevant personnel on site.

3.1.3、挤出机的就位和安装 Extruder inplace and installation

挤出机的就位和安装通常与生产线上其它设备一起进行，就位时必须遵循生产线基础图（由我公司设计部门提供）。调整好挤出机和整个生产线之间的相对位置，同时调整好挤出机自身的水平位置（料筒口和进料口处的安装表面均可作为测量基准）。

The placement and installation of the extruder is usually carried out with other equipment on the production line and must be followed in accordance with the production line base diagram (provided by our design department). Adjust the relative position between the extruder and the entire production line, and adjust the horizontal position of the extruder itself (the mounting surface at the barrel opening and the inlet can be used as the measurementbasis).

3.1.4、挤出机主要部件 Main components of the extruder

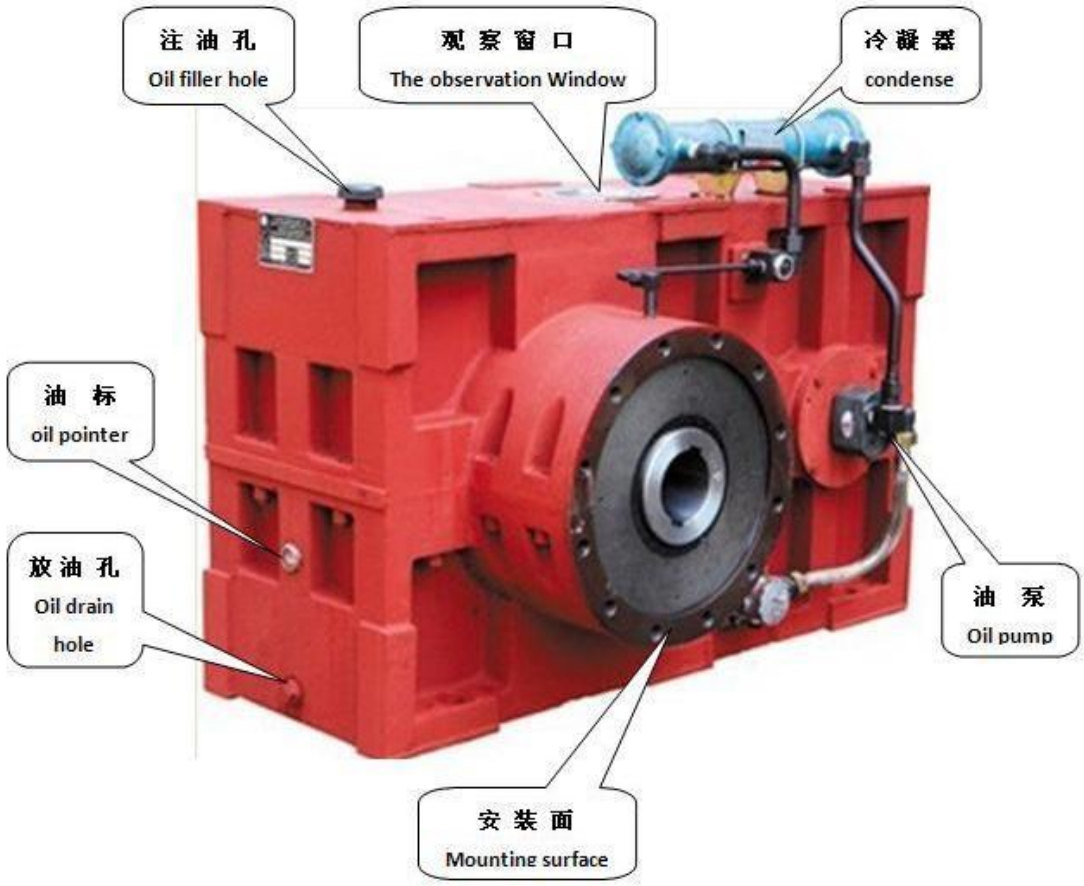
3.1.4.1、齿轮减速箱基本参数和安全操作说明 Gearbox basic parameters and safe operating instructions

螺杆挤出机专用齿轮箱是专门为塑料、橡胶单螺杆挤出机配套设计的高精度硬齿面齿轮传动装置。产品参照 JB/T 8853-2001《圆柱齿轮减速机》设计，其齿轮和齿轮轴材料采用高强度低碳合金钢，齿面经渗碳、淬火、磨齿加工而成，齿轮精度达到 6 级（GB/T 10095）齿面硬度 HRC54~62，输出轴前端配有大规格的推力轴承，承受螺杆轴向推力。

The special screw box for screw extruder is a high-precision hard-toothed gear transmission designed specifically for plastic and rubber single-screw extruders. The product is designed according to JB/T 8853-2001 "Cylindrical Gear Reducer". The gear and gear shaft material is made of high-strength low-carbon alloy steel. The tooth surface is processed by carburizing, quenching and grinding. The gear precision reaches 6 grades. GB/T 10095) Tooth surface hardness HRC54~62, the front end of the output shaft is equipped with a large-size thrust bearing to withstand the axial thrust of thescrew.

3.1.4.1.1、使用范围 Scope of use

- 原动机输入转速不高于 1500转/分
- 齿轮传动圆周速度不大于 20米/秒
- 工作环境温度-40℃～45℃，在环境温度低于 0℃情况下工作时，启动前对润滑油预热至 0℃以上，或者选用低温润滑油。）
- The prime mover input speed is not higher than 1500 rpm
- Gear drive peripheral speed is not more than 20 m / s
- Working environment temperature -40 ° C ~ 45 ° C, when the ambient temperature is lower than 0 ° C, before the start, preheat the lubricating oil to above 0 ° C, or use low temperature lubricant.)



塑料单螺杆挤出机用齿轮箱外形图

Outline drawing of gear box for plastic single screw extruder

注意：Attention

- 本减速机可用于正、反两方向运转，但部分机型高速轴带单向油泵，默认方向为：面对输出轴，输出轴为顺时针旋转。
- The reducer can be used in both forward and reverse directions, but some models have high-speed shafts with one-way oil pumps. The default direction is: facing the output shaft, the output shaft rotates clockwise.

减速机的安装与联接 Reducer installation and connection

- 减速机的安装基础必须平整、牢固、可靠、稳定，特殊场合工位的安装应慎重考虑，在地脚螺栓均匀紧固的情况下保证插入输出轴中的螺杆无卡滞地均匀回转；
- The installation foundation of the reducer must be flat, firm, reliable and stable. The installation of the special occasion work station should be carefully considered. When the anchor bolts are evenly tightened, the screw inserted into the output shaft is ensured to rotate without any stagnation;
- 减速机与原动机的联接应优先考虑误差补偿联接方式，减速机输入轴轴心线联接部分的轴心线要保证同轴度，同时应检查轴向偏差及角位移量，其误差不得大于所用联轴器的允许值；
- The connection between the reducer and the prime mover should give priority to the error

compensation connection mode. The axial line of the input shaft axis of the reducer should ensure the coaxially. At the same time, the axial deviation and angular displacement should be checked. The error should not be greater than the used. The allowable value of the coupling;

- 安装完毕，在减速机中加入润滑油，润滑油在箱体内分布均匀后润滑油油位至油标中心线；
- After the installation is completed, the lubricating oil is added to the reducer, and the lubricating oil is evenly distributed in the tank body to the oil mark centerline;
- 接通水冷系统，检查各接头处是否有渗、漏水现象
- Connect the water cooling system and check if there is any seepage or water leakage at each joint.
- 接通电源，让减速机短时间空载运行，检查设备运行时润滑管路润滑油是否正常，是否有渗、漏油现象，安装零部件是否松动，是否有异常响声；
- Turn on the power, let the reducer run for a short period of time, check whether the lubricating oil in the lubrication pipeline is normal when the equipment is running, whether there is leakage or oil leakage, whether the installation parts are loose, and whether there is abnormal noise;

注意：Attention

- 在对所有联轴器进行安装作业时，应切断电机电源并采取措施（如悬挂警示标识）防止意外接通;
- When installing all couplings, cut off the motor power and take measures (such as the suspension warning sign) to prevent accidental connection;
- 联轴器、小齿轮等不允许使用榔头敲击方式套装至轴端部上;
- Couplings, pinions, etc. are not allowed to be applied to the end of the shaft using a hammer tapping method
- 安装皮带轮时应注意皮带的正确张力;
- Pay attention to the correct tension of the belt when installing the pulley;
- 输出部分不得采用强力装拆螺杆;
- The output part shall not be equipped with a strong mounting screw;
- 减速机的外露旋转部分（联轴器、皮带轮）应加防护罩;
- The exposed rotating part of the reducer (coupling, pulley) should be equipped with a protective cover;
- 联接轴端和法兰表面必须彻底清除掉防锈剂、污染物或类似脏物，可使用溶剂清洗，清洗时不得让溶剂进入轴端密封部件的密封唇上，否则会损坏密封材料。
- The shaft end and flange surface must be completely cleaned of rust inhibitors, contaminants or similar dirt. It can be cleaned with solvent. Do not allow solvent to enter the sealing lip of the shaft end seal when cleaning, otherwise the sealing material will bedamaged.

3.1.4.1.2、开机前检查项目：Check items before starting

- 使用前，首先检查减速机箱体内是否有润滑油，油位是否正确，若润滑油不足则应及时补充；
- 各联结部位是否松动，安全防护装置是否齐备；
- 环境温度是否低于 0℃，低于 0℃情况下工作时，启动前对润滑油预热至 0℃以上。
- Before use, first check whether there is lubricating oil in the gearbox body, the oil level is correct, if the oil is insufficient, it should be replenished in time;
- Whether the joints are loose or not, and whether the safety guards are complete;
- Whether the ambient temperature is lower than 0 °C, when working below 0 °C, preheat the

lubricating oil to above 0 °C before starting.

3.1.4.1.3、减速机运行：Reducer operation:

- 减速机应空转 5~10分钟（若减速机配电机齿轮泵，则在减速机开机前开启电机齿轮泵），使各轴承、齿轮处充分润滑后加载使用；若减速机为首次使用，空运转后逐级加载，每级加20%额定载荷运行 1~2小时，直至额定载荷，无异常现象进入正常运行。
- 在减速机运行过程中，适时监控减速机的温升，并作好记录。当减速机温度超过 70℃或油温超过 100℃时，应停止使用，查明原因并排除故障，必要时与本公司售后服务部联系。故障排除后重新更换润滑油方可使用。
- 减速机停机按如下程序操作：首先关闭进料斗，待螺筒内物料输送完毕关闭减速机电机电源（若减速机配电机齿轮泵，则在减速机关机后关闭电机齿轮泵）
- 如果减速机长时间停止使用，必须每隔 2～3周让减速机运转一次。
- 如果减速机停止使用时间超过 6个月，就需要对减速机内部和外部额外采取防锈措施：内部用润滑油充满；外部使用蜡质防锈涂层对轴端和未经油漆表面进行防锈处理，并使用润滑脂涂抹在轴密封部件的密封唇上以防止防锈剂渗入。
- The reducer should be idling for 5~10 minutes (if the reducer is equipped with a motor gear pump, turn on the motor gear pump before the reducer is turned on), so that the bearings and gears are fully lubricated and then loaded; if the reducer is used for the first time, After the operation, it is loaded step by step. Each stage is loaded with 20% rated load for 1~2 hours, until the rated load, no abnormal phenomenon enters normal operation.
- During the operation of the reducer, monitor the temperature rise of the reducer in a timely manner and make a record. When the speed of the reducer exceeds 70 °C or the oil temperature exceeds 100 °C, stop using it, find out the cause and eliminate the fault, and contact the after-sales service department if necessary. Replace the lubricant after trouble shooting and use it.
- The stop of the reducer is as follows: first close the feed hopper, and turn off the motor power of the reducer after the material is delivered in the screw (if the reducer is equipped with a motor gear pump, turn off the motor gear pump after the reducer).
- If the gear unit is to be used for a long time, the gear unit must be operated once every 2 to 3 weeks.
- If the gear unit is out of service for more than 6 months, additional rust protection measures should be taken inside and outside the gear unit:

注意：Attention

- 在开车的初始阶段，油泵可能会发出较高的噪声，这是因为润滑油粘度大、油泵的吸油阻力大而引起，该现象在润滑油温度升高后自行消失；
- 在减速机正常使用过程中出现油泵噪声增大，此时应清洗滤油器，保证油路畅通；
- 在减速机运行过程中应适时监控减速机漏油情况，发现漏油现象，及时停机排除；
- In the initial stage of driving, the oil pump may emit high noise, which is caused by the high viscosity of the lubricating oil and the large oil absorption resistance of the oil pump. This phenomenon disappears spontaneously after the temperature of the lubricating oilrises;
- During the normal use of the reducer, the oil pump noise increases. At this time, the oil filter should be cleaned to ensure that the oil passage is unblocked;
- During the operation of the reducer, the oil leakage of the reducer should be monitored in a timely manner, and the oil leakage phenomenon should be detected and stopped in time;

3.1.4.1.4、减速机的检查、维护 Inspection and maintenance of the reducer

- 检修与维护时间间隔 Over haul and maintenance interval

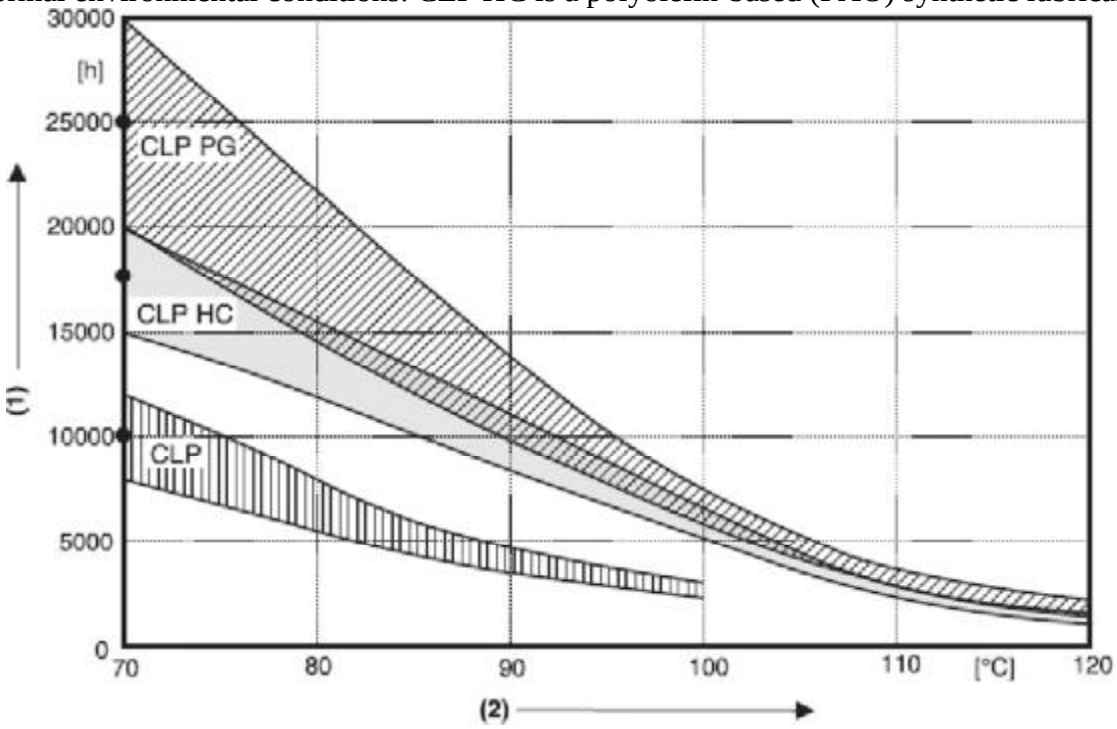
时间间隔 time interval	检修与维护 Inspection and maintenance
正常工作运行 Normal operation	❙ 检查减速机温度：使用矿物润滑油时，不得超过 90℃ 使用合成润滑油时，不得超过 100℃ ❙ 检查减速机噪声有无异常 ❙ 检查减速机是否有泄漏现象 ❙ Check the speed of the gear unit: When using mineral oil, do not exceed 90 ° C When using synthetic lubricants, do not exceed 100 ° C ❙ Check if the noise of the reducer is abnormal ❙ Check the reducer for leaks
在运行500-800 小时后 After 500 to 800 hours of operation	❙ 首次投入运行后的第一次润滑油更换检查油位是否需加注润滑油 ❙ The first time the oil is replaced after the first operation, check if the oil level needs to be filled with oil.
每隔运行 3000 小时， 至少半年一次 Run every 3,000 hours, at least once every six months	❙ 检查润滑油，若在室外或潮湿环境，应检查油中水含量，不得超过500ppm ❙ 更换矿物润滑油（每天工作时间不足 8 小时） ❙ 清洁通气塞 ❙ Check the lubricating oil. If it is outdoors or in a humid environment, check the water content in the oil and do not exceed 500ppm. ❙ Replace mineral oil (less than 8 hours per day) ❙ Cleaning the vent plug
根据使用情况而定，至 少 3 个月一次 Depending on usage, at least 3 months	❙ 更换矿物润滑油（长期连续工作） ❙ 检查各处联接螺栓有无松动 ❙ 检查污染情况和润滑冷却装置状态 ❙ 清洁润滑油过滤器，如有必要更换滤芯 ❙ Replace mineral lubricants (long-term continuous operation) ❙ Check if the connecting bolts are loose or not ❙ Check for contamination and lubricate the cooling unit status ❙ Clean the oil filter and replace the filter if necessary
根据使用情况而定，至 少一年一次 Depending on usage, at least once a year	❙ 更换合成润滑油 ❙ Replace synthetic lubricant
根据环境及使用情况而 定 Depending on the environment and usage	❙ 改善或更换表面防护（锈）漆 ❙ 清洁减速机外表面 ❙ 检查配置的附件装置 ❙ Improve or replace surface protection (rust) paint ❙ Cleaning the outer surface of the reducer ❙ Check the configured accessory device

ü 润滑油更换时间间隔 Lubricating oil replacement interval

在恶劣环境条件下使用的特殊规格减速机应经常更换润滑油，下图为正常环境条件使用下的润滑油更换时间间隔，CLPHC为聚烯烃基(PAO)合成润滑油

Special specification gearboxes used under harsh environmental conditions should be replaced

frequently.The following figure shows the time interval for lubricating oil replacement under normal environmental conditions. CLP HC is a polyolefin-based (PAO) synthetic lubricant.



(1)为运行时间　　(2)油池持续温度（平均值为 70℃)

(1) running time　(2) oil pool continuous temperature (average 70 °C)

3.1.4.1.5、故障分析与排除 Fault analysis and elimination

故障现象 Fault phenomenon	可能原因 possible reason	排除方法 Method of exclusion
异常、均匀的运转噪声 Abnormal, uniform running noise	❙ 滚动/碾压噪声：轴承损坏 ❙ 敲击式噪声：啮合不均匀 ❙ Rolling/rolling noise: bearing damage ❙ tapping noise: uneven meshing	❙ 检查润滑油，更换轴承 ❙ 向厂家咨询 ❙ Check the lubricant and replace the bearing ❙ Consulting with manufacturers
异常、不均匀的运转噪声 Abnormal, uneven running noise	❙ 润滑油杂质 ❙ Lubricating oil impurities	❙ 检查润滑油 ❙ 停止运行,向厂家咨询 ❙ Check lubricant ❙ Stop running, consulting with manufacturers
在减速机固定区域内的异常噪声 Abnormal noise in the fixed area of the reducer	❙ 减速机固定件有松动 ❙ Reducer fixing parts are loose	❙ 检查紧固件，使用规定的紧固件 ❙ Check fasteners, use specified fasteners
运行温度太高 Operating temperature is too high	❙ 润滑油过多 ❙ 润滑油变质或杂质较多 ❙ 润滑泵损坏 ❙ 冷却系统故障 ❙ too much lubricant	❙ 检查油位，如有必要修正 ❙ 检查润滑油质量及更换时间 ❙ 检查润滑泵， 如有必要请更换

	❙ Lubricating oil is deteriorated or contains more impurities ❙ Lubrication pump damage ❙ cooling system failure	❙ 检查冷却系统 ❙ Check the oil evel and correct if necessary ❙ Check quality and replacement time ❙ Check the lubrication pump and replace if necessary ❙ Check the cooling system
磨合期内轴端密封处温度太高 The temperature at the shaft end seal is too high during the running-in period	❙ 轴端联接安装时未清理 ❙ 密封部件与轴端的磨合 ❙ When the shaft end joint is installed, the seal member and the shaft end are not cleaned.	❙ 清理轴端 ❙ 可视作正常现象 ❙ Clean the shaft end ❙ Can be regarded as normal
润滑油泄漏： ❙ 减速机结合面 ❙ 减速机端盖面 ❙ 减速机视孔盖 ❙ 传动轴密封处 ❙ 放油塞处 ❙ 通气塞处 Lubricating oil leakage: ❙ Reducer joint ❙ Reducer end cover ❙ Reducer sight cover ❙ Drive shaft seal ❙ At the drain plug ❙ Vent plug	❙ 减速机连接部件不紧密 ❙ 联接紧固件松动 ❙ 密封部件安装不正确 ❙ 密封部件损坏/ 磨损 ❙ 润滑油位过多 ❙ 安装错误 ❙ Reducer coupling parts are not tight ❙ Loose fasteners loose ❙ Sealing parts are not installed correctly ❙ Sealed parts damaged / worn ❙ Too much lubricant ❙ Installation error	❙ 检查联接螺栓发现松动及时拧紧 ❙ 检查密封部件并看情况更换 ❙ 检查油位/ 改善排气 ❙ 向厂家咨询 ❙ Check the coupling bolts and find that they are loose and tightened in time. ❙ Check the seals and see if they are replaced ❙ Check the oil level/ improve the exhaust ❙ Consulting with manufacturers
轴承位置上温度太高 The temperature at the bearing position is too high	❙ 润滑油过少 ❙ 润滑油老化变质 ❙ 润滑泵损坏 ❙ 轴承损伤 ❙ too little lubricant ❙ lubricating oil aging deterioration ❙ lubrication pump is damaged ❙ bearing damage	❙ 检查油位，如有必要修正 ❙ 检查润滑油更换时 ❙ 检查润滑泵，更换 ❙ 检查轴承，更换 ❙ Check the oil level and correct if necessary ❙ Check the lubricant replacement time ❙ Check Lubrication pump, replace ❙ Check the bearing and replace it

3.1.4.1.6、润滑油的选择 Lubricating oil selection

润滑油的粘度按高速级齿轮圆周速度 V、使用环境或润滑方法选择：

当V≤2.5米/秒或当环境温度在35℃～50℃之间时，应选用CKC320中负荷工业闭式齿轮油

或CKD320重负荷工业闭式齿轮油，当 V＞2.5米/秒或采用强制循环油润滑时，应选用CKC220中负荷工业闭式齿轮油或CKD220重负荷工业闭式齿轮油。

The viscosity of the lubricating oil is selected according to the peripheral speed V of the high-speed gear, the use environment or lubrication method:When V≤2.5 m/s or when the ambient temperature is between 35 °C and 50 °C, CKC320 medium load industrial closed gear oil or CKD320 heavy duty industrial closed gear oil should be used.When V>2.5 m/s or when using forced circulation oil lubrication, CKC220 medium load industrial closed gear oil or CKD220 heavy duty industrial closed gear oil should be used.

润滑剂 Lubricant

减速机不推荐使用润滑脂润滑，如有需要，敬请垂询国内外润滑油牌号对照请参见附录-润滑油对照表

It is not recommended to use grease lubrication for the reducer. If necessary, please contact domestic and foreign lubricants for reference. Please refer to the appendix-Lubricant Comparison Chart

3.1.4.2、主电机基本参数和安全操作说明 Main motor basic parameters and safe operation instructions

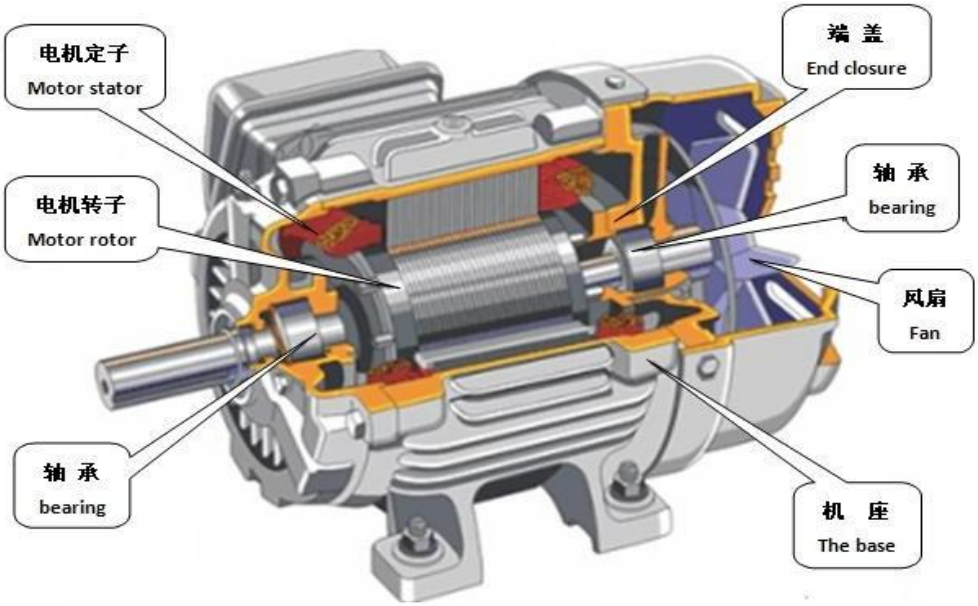
Y 系列电动机是一般用途的全封闭自扇冷却式鼠笼型三相异步电动机。安装尺寸和功率等级符合 IEC 标准，外壳防护等级为 IP44，冷却方式为 IC411，连续工作制（S1）。适用于驱动无特殊要求的机械设备，如机床、泵、风机、压缩机、搅拌机、运输机械、农业机械、食品机械等。

The Y series motor is a general-purpose fully enclosed fan-cooled squirrel-cage three-phase asynchronous motor. The installation dimensions and power levels are in accordance with IEC standards, the enclosure protection class is IP44, the cooling method is IC411, and the continuous operation system (S1). It is suitable for driving mechanical equipment without special requirements, such as machine tools, pumps, fans, compressors, mixers, transportation machinery, agricultural machinery, food machinery, etc.

Y80-315电动机采用 B级绝缘，Y355电动机采用 F级绝缘，额定电压为 380V，额定频率50Hz。电动机运行地点的海拔不超过1000m；环境空气温度随季节而变化，但不超过 40℃；最低环境空气温度为-15℃；最湿月月平均最高相对湿度 90%；同时该月月平均最低温度不高于 25℃。

Y80-315motor adopts Class B insulation, Y355 motor adopts Class F insulation, rated voltage is 380V, front frequency is 50Hz. The altitude at which the motor is operated does not exceed 1000m; the ambient air temperature varies with the season, but does not exceed 40°C; the minimum ambient air temperature is -15°C; the wettest month average average relative humidity is 90%; and the monthly average monthly minimum temperature Not higher than 25 ° C.

内部结构简图



3.1.4.2.1、启动 start up

❙ 检验 test

检查电机有无外部损伤，检验所有的铭牌数据，尤其是电压和绕组的连接方式（Y 或△）。用手旋转转轴，检验空载情况，如果电机装有锁定装置，注意将其打开。Check the motor for external damage and verify all nameplate data, especially the voltage and winding connections (Y or △).Rotate the shaft by hand to check for no-load conditions. If the motor is equipped with a locking device, be careful to open it.

❙ 绝缘性能检测 Insulation performance test

电机初次使用前，绕组有可能受潮，都要测量其绝缘电阻值。25℃时测量的绝缘电阻值应超过参考值，测量后绕组要立即放电，避免电击。周围环境温度每升高 20℃，电阻的参考值减少一半。如果没有达到绝缘电阻的参考值，绕组就必须烘干。烘炉的温度为 90℃，时间 12-16 小

时。如果安装了排水管，烘干时必须将其打开，绕组被海水浸泡后一般要重绕。

Before the motor is used for the first time, the winding may be wetted, and its insulation resistance value shall be measured. The insulation resistance measured at 25 °C should exceed the reference value, and the winding should be discharged immediately after measurement to avoid electric shock. For every 20 °C increase in ambient temperature, the reference value of the resistance is reduced by half. If the reference value of the insulation resistance is not reached, the winding must be dried. The temperature of the oven was 90 ° C for 12-16 hours. If a drain is installed, it must be opened during drying and the windings are usually re-wound after being soaked in seawater.

- 直接启动或 Y/△启动 Direct startorY/△start

标准单速电机的接线盒一般有 6个接线螺栓和至少一个接地螺栓，电机通电之前，必须按规定要求可靠接地，不能用零线代替接地。（电压和绕组连接方式在铭牌上有标注）

The standard single-speed motor junction box generally has 6 terminal bolts and at least one grounding bolt. Before the motor is energized, it must be reliably grounded according to the specified requirements. The neutral line cannot be used instead of the grounding. (The voltage and winding connections are indicated on the nameplate).

- 直接启动 Direct start

绕组可以采用Y或△接法，例如 600V,380V△分别表示：660V-Y接法和380V-△接法。

The winding can be connected by Y or △ , for example, 600V, 380V △ respectively:660V-Y connection and 380V-△ connection.

- Y/△启动 Y/△start

电源电压必须等于△接法电机的额定电压。

The power supply voltage must be equal to the rated voltage of the△connected motor.

拆卸接线板上所有的接线片，按 Y/△起动装置接线，妥善连接到电机六个接线柱上，并能从起动初期的 Y连接跳到自动完成的△连接。双速电机和其他特种电机的电源接法，必须依照接线盒内的接线图说明。

Remove all the lugs on the terminal block, press the Y/△starter wiring, properly connect to the six terminals of the motor, and jump from the initial Y connection to the automatically completed△connection. The power connection of the two-speed motor and other special motors must be in accordance with the wiring diagram in the junction box.

- 接线柱和旋转方向 Terminal and direction of rotation

如果电源相序 U、V、W依次与接线柱U1、V1、W1连接，从电机的驱动端观察转轴，其旋转方向为顺时针。换接电线中的任意两相就可以达到改变电机的旋转方向。

If the power phase sequence U, V, W is connected to the terminals U1, V1, and W1 in sequence, the rotation axis is viewed from the driving end of the motor, and the rotation direction is clockwise. Changing the two phases in the wire can change the direction of rotation of the motor.

3.1.4.2.2、使用说明 Instructions for use

- 运行环境 operating environment

电机用于工业生产，正常的环境温度在-15℃到+40℃之间，海拔不高于 1000m。

The motor is used in industrial production. The normal ambient temperature is between -15 ° C and +40 ° C and the altitude is not higher than 1000 m.

- 安全要素 Security elements

电机应由熟悉相关要求的专业人员安排和接线，安装时必须有安全装置以防止事故发生， 安装的位置也必须符合规定。

The motor should be arranged and wired by a person familiar with the relevant requirements. Safety devices must be installed to prevent accidents, and the installation location must also

comply with the regulations.

- 遵守规格 Compliance with specifications

电机不能用于加速和超载运行，正常运行时，电机表面会发热，但不会超过额定许用温度的60%，一些有特殊用途的电机需要特别的指导说明。

The motor cannot be used for acceleration and overload operation. In normal operation, the surface of the motor will heat up, but it will not exceed 60% of the rated allowable temperature. Some special-purpose motors require special instructions.

3.1.4.2.3、安装 Installation

- 底脚螺栓安装 foot bolt installation

拧紧电机底脚和垫板间的螺栓并留有 1-2mm 的缝隙。采用合适的方式调整电机对接同心度后，再均匀拧紧螺栓。如果电机轴伸与负载刚性连接，则同心度调好后，两者的底脚都必须与底座间各安装二个定位钉，防止电机运转时破坏连接同心度而损坏电机。

Tighten the bolts between the motor foot and the backing plate and leave a 1-2mm gap. After adjusting the motor's butt concentricity in a suitable way, tighten the bolt evenly. If the motor shaft extension is rigidly connected to the load, after the concentricity is adjusted, the two legs must be installed with two positioning pins between the bases to prevent the connection concentricity and damage the motor when the motor is running.

- 调整安装 adjustment installation

正确的安装对避免轴承振动和可能造成的外部磨损都十分重要的。

Proper installation is important to avoid bearing vibration and possible external wear.

- 滑轨和皮带轮 slide rails and pulleys

将滑轨水平放置，检查电机转轴是否平行于被驱动轴。注意，皮带张得过分紧或皮带轮残留不太平衡都会损伤轴伸，甚至引起轴断裂，也会影响轴承寿命，不要超过产品说明中规定的最大张紧力。

Place the rails horizontally and check that the motor shaft is parallel to the driven shaft. Note that if the belt is too tight or the pulley residual is not balanced, it will damage the shaft extension and even cause the shaft to break. It will also affect the bearing life and not exceed the maximum tension specified in the product description.

3.1.4.2.4、电气联接 electrical connection

电机顶部的接线盒允许旋转，可按要求选择出线方向，也可选用旁出线的接线盒安装方式。没有电缆进入的进线口必须封闭，除了主绕组和接地端的接线端，接线盒内还可包括热敏电阻、热敏开关或 PT100电阻元件的接线部件。

注意：电机停转时，在接线盒内仍可能带电，不要立即触摸接线柱。打开接线盒，可以在接线盒内找到电源连接示意图。

The junction box on the top of the motor is allowed to rotate. The outlet direction can be selected as required. The junction box installation method can also be used. The inlet without cable entry must be closed. In addition to the main winding and ground terminals, the junction box can also include the thermistor, thermal switch or PT100 resistor component wiring components.

Note: When the motor is stopped, it may still be charged in the junction box. Do not touch the terminal immediately. Open the junction box and find the power connection diagram in the junction box.

3.1.4.2.5、安装和拆卸 installation and disassembly

- 概论 Introduction

必须由专业人员采用专门的工具按照规定进行。

Special tools must be used by professionals to follow the rules.

- 轴承 bearing

对轴承要予以特别重视，安装，拆换轴承要加热或使用特殊工具。

Special attention should be paid to the bearings. Installation, replacement of bearings should be done by heating or using special tools.

- 离合器和皮带轮的安装 Clutch and pulley installation

安装离合器和皮带轮时，要使用适当的装置和工具，不要与轴伸配合太紧，装配前需拆下风轴传到其他定位工件上，以防损坏轴承和轴伸，安装时不能重锤猛击，拆卸时也不能使用杠杆压靠机身。

When installing the clutch and pulley, use appropriate equipment and tools. Do not fit too tightly with the shaft. Before assembly, remove the wind shaft and transfer it to other positioning workpieces to prevent damage to the bearing and shaft extension. Also, you cannot use the lever to press against the body when disassembling.

- 平衡 balance

标准电机，采用半键平衡，为了避免振动，离合器和皮带轮必须经过半键平衡，才能安装到电机轴上。

The standard motor is balanced with a half button. To avoid vibration, the clutch and pulley must be balanced by a half button to be mounted on the motor shaft.

3.1.4.2.6、维护与润滑 maintenance and lubrication

- 检查项目 Inspection items

Ø 定期检修电机；Regularly overhaul the motor;

Ø 保持电机清洁，空气流通；Keep the motor clean and air circulation;

Ø 检查轴伸的密封圈，如有必要应及时更换；Check the sealing ring of the shaft extension and replace it if necessary;

Ø 检查安装连接状况和安装螺钉；Check the installation connection status and installation screws;

Ø 通过监听异常噪声、振动测量，监控用油量或轴承测振元件来检查轴承运行情况；

Check the operation of the bearing by monitoring the abnormal noise, vibration measurement, monitoring the oil quantity or the bearing vibration measuring element;

Ø 如有异常发生，应立即停机，检查原因并及时排除。

If any abnormality occurs, stop immediately, check the cause and eliminate it in time.

- 润滑 Lubrication

装封闭型或开启式轴承的电机，电机中心高在225及以下，用户无特殊要求的电机一般装配封闭型轴承，轴承的型号在相关的产品样本中有介绍，装开启式轴承的电机，要求定期重新加润滑脂。具体要求如下：

Motor with closed or open bearing，Motors with a height of 225 or less are generally equipped with closed bearings. The models of the bearings are described in the relevant product samples. The motors with open bearings require regular re-greasing. Specific requirements are as follows:

机座号 Cabin seat no	油脂量g Amount of oil	3600 r/min	3000 r/min	1800 r/min	1500 r/min	1200 r/min	1000 r/min	500-900 r/min
112/132	15	4200	4800	7000	7800	8500	10000	10500
160/180	20	3200	4200	6000	7000	8000	9000	10000
200/225	25	1800	3100	5500	6500	7500	8500	9500
250/280	35	800	2000	5000	6000	7000	8000	9000
315	50	800	2000	4600	5500	6500	7500	8000
355	60		1000	4000	5000	6000	7000	8000

滚柱轴承电机添加润滑脂的间隔时间Roller bearing motor lubrication interval time

机座号 Cabin seat no	油脂量g Amount of oil	3600 r/min	3000 r/min	1800 r/min	1500 r/min	1200 r/min	1000 r/min	500-900 r/min
160/180	20	1600	2000	4700	5400	6200	6900	7800
200/225	25	900	1500	4300	5000	5800	6500	7000
250/280	35	400	1000	3300	4500	5500	6300	6800
315	50	400	1000	2700	3800	5000	6000	6500
355	60			2200	3200	4400	5500	6000

加注润滑油时注意事项：Precautions when filling lubricant:

1、装注油嘴的电机；A motor for filling a grease nipple;

2、在电机运行时润滑；Lubricate when the motor is running;

3、加润滑油脂前，应打开油脂出口塞；Before adding grease, the grease outlet plug should be opened;

4、如果装有油脂前，应打开油脂出口塞；If grease is installed, the grease outlet plug should be opened;

5、如果装有加油示意牌，亦可以以它为准；If a fueling sign is installed, it can also be used as it is;

6、垂直安装的电机添加润滑脂的间隔时间是表中规定数值的一半。表中规定的数值基于轴承温度为 80℃；The interval between the vertical installation of the motor and the grease is half of the value specified in the table. The values specified in the table are based on the bearing temperature of 80 ° C;

7、轴承温度每升高 15K，表中规定数值应该减少一半；For every 15K increase in bearing temperature, the value specified in the table should be reduced by half;

8、如果轴承最高温度为 70℃，表中数值应加倍；If the maximum temperature of the bearing is 70 °C, the value in the table should be doubled;

注意：运行温度不能超过油脂和轴承最高允许温度，高速运行或过载低速运行时，需要缩短添加润滑脂的间隔，一般双速电机添加润滑脂的间隔需要将表中数值减少大约 40%，在高速运行时，必须检查轴承的适用性。

Note: The operating temperature should not exceed the maximum allowable temperature of grease and bearing. When running at high speed or under low speed, it is necessary to shorten the interval of adding grease. Generally, the interval between grease added in two-speed motor needs to reduce the value in the table by about 40%. The suitability of the bearing must be checked during operation.

Ⅰ 润滑脂 grease

在更换润滑脂时，只能使用具有以下特性的轴承润滑脂：When replacing grease, use only bearing greases with the following characteristics:

1、良好质量的锂基；Good quality lithium base;

2、在 40℃基脂粘度为 100-140CST；The viscosity of the base fat at 40 ° C is 100-140CST;

3、浓度等级 NLGL2 或 3；Concentration level NLGL2 or 3;

4、温度范围从-30℃到+120℃；the temperature range from -30 ° C to +120 ° C;

如果润滑脂发生改变并且不能确定新旧的兼容性，在短期内多次润滑以代替旧的润滑脂， 高负载或低转速的轴承需要 EP润滑脂，如果因轴承温度大于 80℃而缩短添加润滑脂的间隔， 可使用高温润滑脂，这种高温润滑脂一般允许轴承温度再高 15K。

If the grease changes and the compatibility between old and new cannot be determined, multiple lubrications will be used in the short term to replace the old grease. High-load or low-speed bearings require EP grease, if the grease is shortened due to bearing temperature greater than 80 °C. The high temperature grease can be used for the interval. This high

temperature grease generally allows the bearing temperature to be 15K higher.

注意：大多数润滑脂会刺激皮肤，引起眼睛发炎；
请遵守生产商的注明所有安全预防措施。
Note: Most greases can irritate the skin and cause eye irritation; Please follow the manufacturer's instructions for all safety precautions

- 噪声要求 Noise requirement

电机的噪声不超过产品样本或铭牌规定数值，对于60Hz电机，噪声等级比 50Hz高3dB（A）。

The noise of the motor does not exceed the value specified on the product catalog or on the nameplate. For 60Hz motors, the noise level is 3dB (A) higher than 50Hz.

3.1.4.3、机筒与螺杆的维护保养 Maintenance of barrel and screw

当挤出机的挤出产量下降或其它原因影响螺杆正常工作时，就应该对螺杆和机筒进行检查，根据螺杆机筒的磨损情况决定更换螺杆机筒或修复。

When the extrusion output of the extruder is reduced or other factors affect the normal operation of the screw, the screw and the barrel should be inspected, and the screw barrel or repair should be replaced according to the wear
condition of the screw barrel.

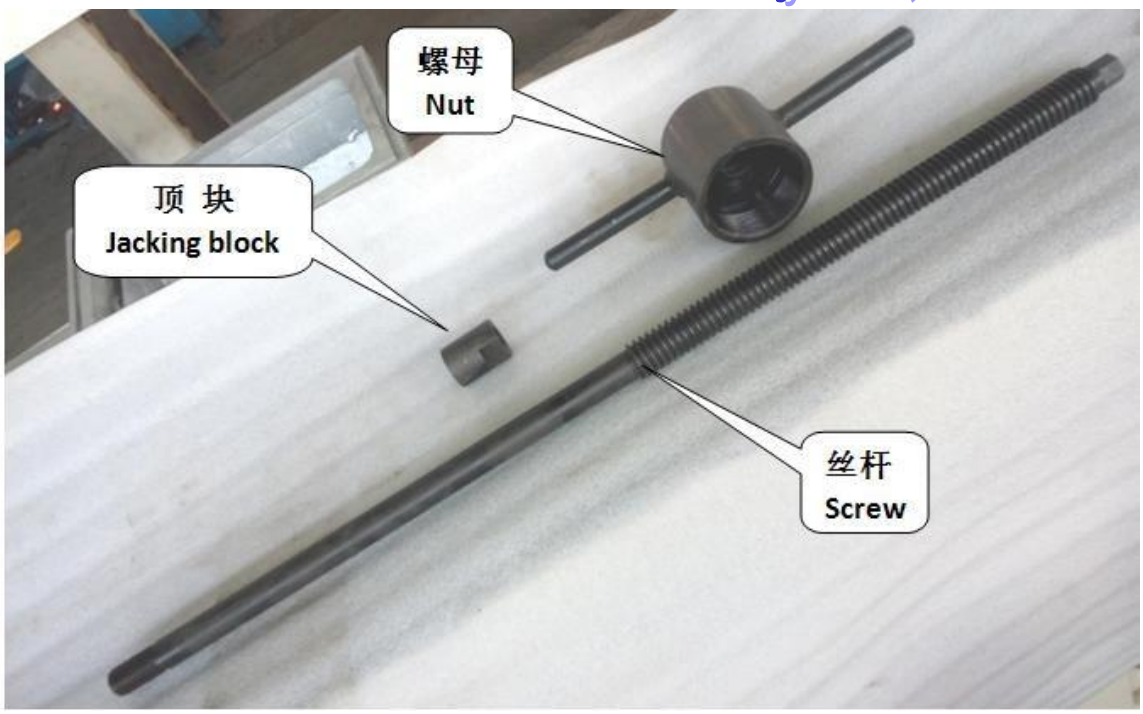
螺杆拆卸、清洗、安装的方法：

Screw removal, cleaning and installation methods:

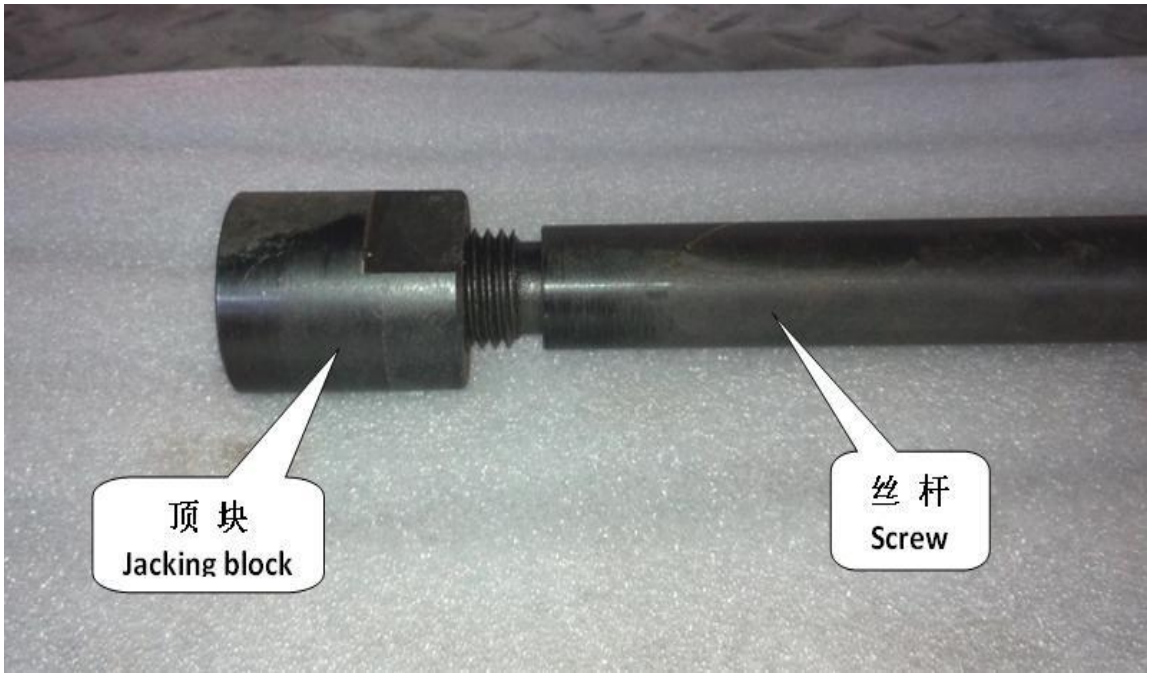
- 螺杆拆卸 screw removal

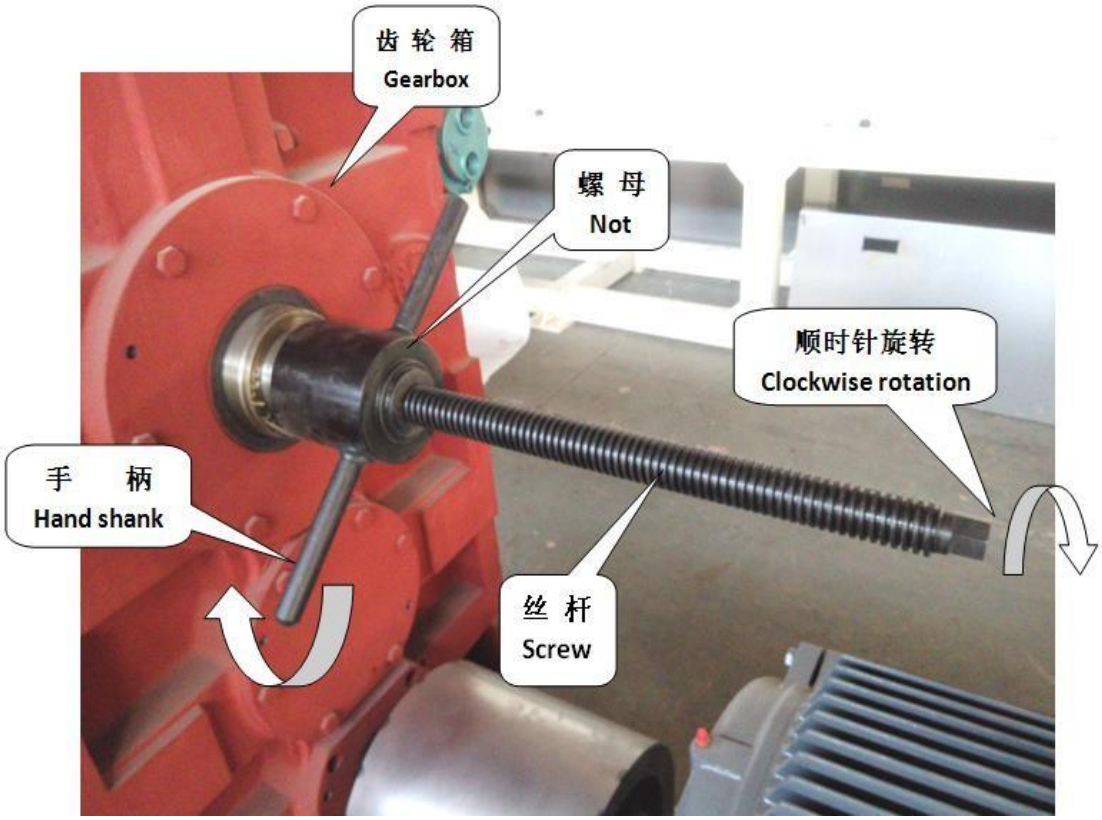
拆卸螺杆前，应先将挤出机机筒连接的流道、换网器、计量泵和模具等拆除，在残余熔体尚未凝结前，采用本机配套提供的专用工具将螺杆从机筒内顶出。如果挤出机已经冷却， 顶出螺杆前要对机筒进行加热，加热到操作温度，然后再次断开电源，顶出前应配套起吊装置，以便在顶出时支承螺杆

Before disassembling the screw, the flow path, screen changer, metering pump and mold connected to the extruder barrel should be removed first. Before the residual melt has not been condensed, the special tool provided by the machine is used to screw the screw from the barrel. Eject. If the extruder has cooled, the barrel should be heated before the screw is ejected, heated to the operating temperature, and then disconnected from the power supply. Before lifting, the lifting device should be equipped to support the screw when it is ejected.



单螺杆挤出机螺杆专用拆装工具
Single screw extruder screw special disassembly tool





螺杆拆卸示意图 brief description of the drawings

首先将丝杆从靠近螺母手柄端旋入一段距离，再将顶块旋入丝杆前端螺牙段（如图所示），把拆卸工具整体由齿轮箱后孔装入，顺时针转动螺母手柄，直到螺母完全旋入齿轮箱后轴为止，接下来用活动扳手顺时针转动丝杆尾部六角头，直到把螺杆柄部被完全顶出齿轮箱输出孔为止，最后，即可通过起吊装置缓缓的将螺杆拖出机筒。

First screw the screw rod from the handle end of the nut into a distance, then screw the top block into the threaded end of the screw rod (as shown), insert the removal tool as a whole from the rear hole of the gear box, and turn the nut handle clockwise. Until the nut is fully screwed into the rear axle of the gearbox, then use the spanner wrench to turn the hex head of the screw shaft clockwise until the screw shank is completely pushed out of the gearbox output hole. Finally, it can be slowly passed through the lifting device. Pull the screw out of the barrel.

拆出后的螺杆，需要放置在开阔平整的地方，并在螺杆下方均匀垫两到四块木块，在螺杆还未冷却之前，清理螺杆表面的残余物料，因螺杆表面具有很高的温度，所以全程需要佩戴耐高温手套，防止裸露皮肤触摸螺杆表面。

The removed screw needs to be placed in an open and flat place, and evenly two to four pieces of wood are placed under the screw. Before the screw is cooled, the residual material on the surface of the screw is cleaned, because the surface of the screw has a high temperature. Therefore, high temperature gloves are required throughout the process to prevent bare skin from touching the surface of the screw.

螺杆安装 Screw mounting

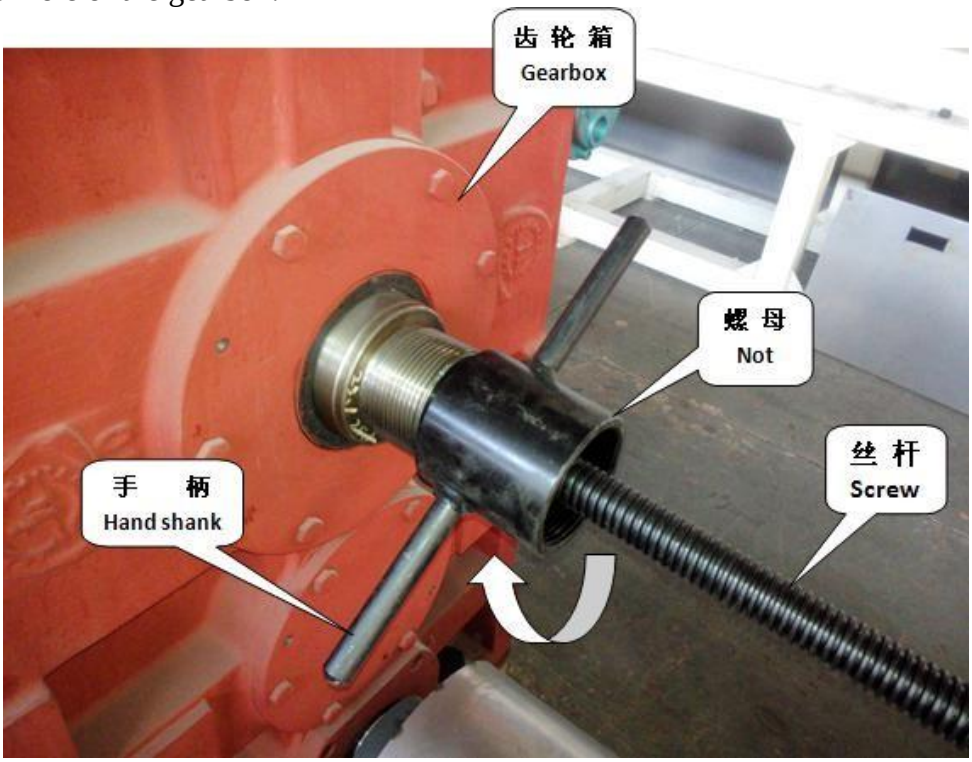
安装前，清洁螺杆表面、机筒内孔和传动轴内孔，然后，机筒内孔涂薄薄的一层硅油， 螺杆轴上涂上一层硅润滑脂。安装前，进料口必须盖上，建议把挤出机加热到操作温度，这样便于安装。

Before installation, clean the surface of the screw, the inner hole of the barrel and the inner hole of the drive shaft. Then, apply a thin layer of silicone oil to the inner hole of the barrel, and apply a layer of silicone grease on the screw shaft. The inlet must be closed before installation. It

is recommended to heat the extruder to the operating temperature for easy installation.

安装时，要将螺杆轴上键与减速箱输出轴的内孔键槽对准，并小心地将螺杆推入机筒，直到螺杆无法轻松推入为止，此时需要使用螺杆安装专用工具，将丝杆六角头旋入螺母靠近手柄侧，待六角头完全露出螺母时，将丝杆前端螺纹由齿轮箱后孔插入，使丝杆前端顶到螺杆柄部中心孔，使用活动扳手顺时针转动六角头，直到丝杆旋紧为止，此时需要手动转动拆装工具螺母手柄，直到角螺杆柄部拖入齿轮箱内孔为止。

When installing, align the screw shaft upper key with the inner hole keyway of the gearbox output shaft, and carefully push the screw into the barrel until the screw cannot be easily pushed in. At this time, you need to use the special tool for screw installation. The hexagonal head of the rod is screwed into the nut near the handle side. When the hexagonal head is completely exposed, insert the thread at the front end of the screw rod into the rear hole of the gear box, and push the front end of the screw rod to the center hole of the screw handle. Use a spanner wrench to turn the hexagon head clockwise. Until the screw is tightened, you need to manually rotate the disassembly tool nut handle until the corner screw handle is pulled into the inner hole of the gearbox.



注意：在安装螺杆过程中，绝不能使用强力，以免损坏键及键槽。如出现螺母手柄无法转动时，需要松掉拖拽螺母，通过齿轮箱后孔观察螺杆柄部键槽与齿轮箱键槽的相互位置，如果位置仅相差在5mm以内，可将螺母拧紧，用手旋紧螺母手柄，保持拉力，然后可由另一名工作人员转动齿轮箱输入轴，注意旋转方向需要与键槽错位方向相同，当两键槽对齐后，螺杆会被轻松拖入齿轮箱内孔。如果以上方法还是无法装入螺杆，则需要将螺杆退出检查键槽，是否有碰伤等情况，待问题解决后可重复以上操作。

Note: Never use strong force during the installation of the screw to avoid damage to the keys and keyway. If the nut handle cannot be rotated, you need to loosen the drag nut. Observe the mutual position of the screw handle keyway and the gearbox keyway through the rear hole of the gearbox. If the position is only within 5mm, tighten the nut and tighten it by hand. The nut handle keeps the tension, and then another operator can turn the gearbox input shaft. Note that the direction of rotation needs to be the same as the direction of the keyway misalignment. When the two keyways are aligned, the screw will be easily dragged into the inner hole of the gearbox. If

the above method still can't be loaded into the screw, you need to withdraw the screw from the inspection keyway, if there is any damage, etc., the above operation can be repeated after the problem is solved.

- 清理螺杆,机筒表面 Clean the surface of the screw and barrel

应使用黄铜刷、铜丝团、黄铜或铝刮刀清理螺杆表面，避免擦伤螺杆。机筒内孔应在热态清理，清理时可使用固定在拉杆上的半圆形刮刀，先将刮刀朝上插入机筒，然后将刮刀半圆面朝下，将残余的熔体刮下，必要时此过程可重复进行，最后用黄铜刷将机筒刷干净，并用棉布对机筒进行最终清理。

The surface of the screw should be cleaned with a brass brush, copper wire, brass or aluminum scraper to avoid scratching the screw. The inner hole of the barrel should be cleaned in a hot state. When cleaning, use a semi-circular scraper fixed on the rod. Insert the scraper upwards into the barrel, then scrape the scraper down, and scrape the residual melt. This process can be repeated, and finally the barrel is brushed with a brass brush and the barrel is finally cleaned with a cotton cloth.

3.1.4.4、加热圈和冷却风机的使用说明 Instructions for use of heating coils and cooling fans

3.1.4.4.1、加热圈 heating coils

主机使用加热圈主要有陶瓷、云母和铸铝加热圈，其中应用最多的为陶瓷加热圈，加热性能和导热稳定，有利于温度的控制，也是加热系统中重要的执行元件。加热圈外形示意图如下:

The main heating coils of the main machine are ceramic, mica and cast aluminum heating coils, among which the most used ceramic heating coils, heating performance and heat conduction stability, is conducive to temperature control, and is also an important actuator in the heating system. The outline of the heating coil is as follows:

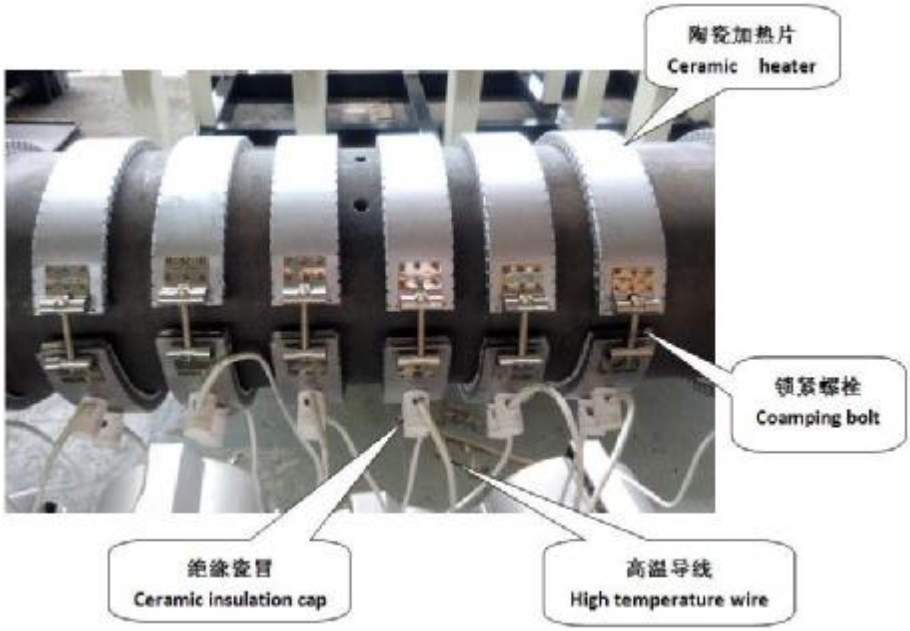
挤出机机筒加热圈外形Extruder barrel heating ring shape

- 加热圈的安装 Heating ring installation

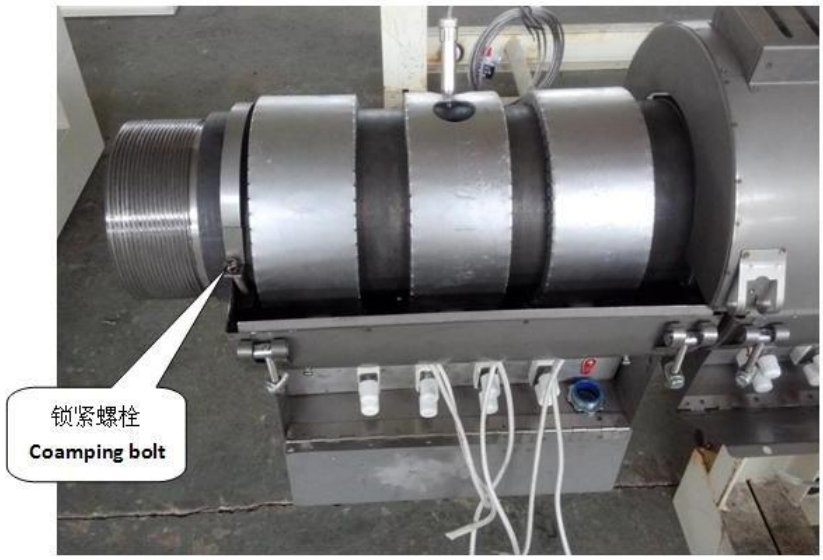
陶瓷加热系统主要由不锈钢金属防护罩和加热片组成。在装配过程中需要注意以下几点：

The ceramic heating system is mainly composed of a stainless steel metal shield and a heating sheet. Pay attention to the following points during the assembly process:

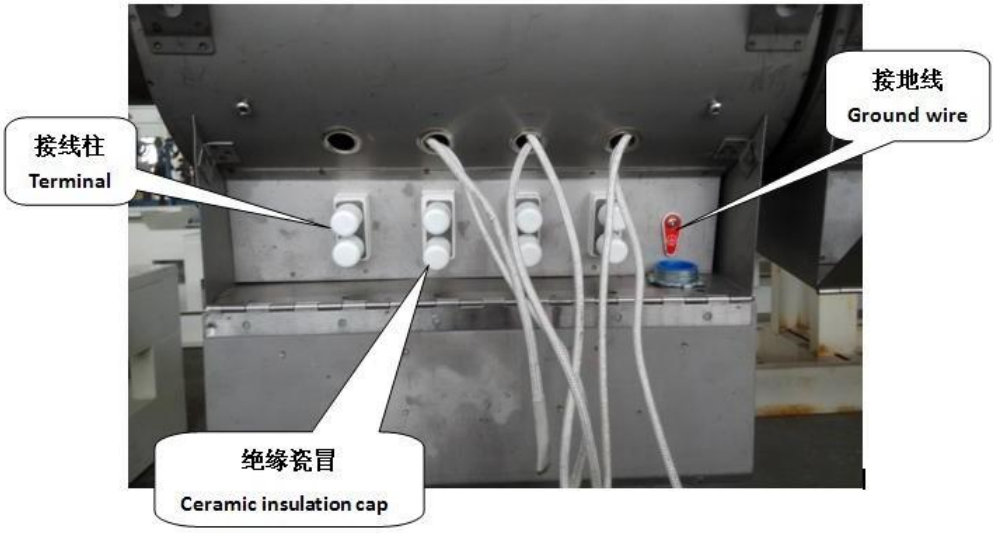
- 陶瓷加热片为易碎品，在安装过程中需要保护好每个瓷片的完整性
  Ceramic heating sheets are fragile and need to protect the integrity of each tile during installation.
- 陶瓷加热片在机筒上以测温孔为中心均匀分布，分布总长度应小于防护罩总长 40mm（如图所示）
  The ceramic heating piece is evenly distributed on the barrel with the temperature measuring hole as the center, and the total length of the distribution should be less than 40mm of the total length of the protective cover (as shown)
- 陶瓷加热片固定在机筒上时，锁紧螺栓应用力应得当，防止螺栓滑丝或瓷片破碎（如图所示）
  When the ceramic heating plate is fixed on the barrel, the locking bolt should be applied properly to prevent the bolt slip or the ceramic chip from breaking (as shown).
- 安装过程中，需要保护好接线柱绝缘瓷冒，如已经造成损坏需要及时更换（如图所示）
  During the installation process, it is necessary to protect the terminal block from insulating porcelain. If it has caused damage, it needs to be replaced in time (as shown)
- 因金属外壳有多处尖角，存在划伤风险，所以装配时请佩戴防护手套，并且在锁紧螺栓时不能用力过猛，造成焊接件开裂或螺栓滑丝，安装原则为双手不能晃动外壳为准
  Because there are many sharp corners in the metal casing, there is a risk of scratching. Therefore, wear protective gloves when assembling, and do not use excessive force when locking the bolts, causing cracks in the welded parts or sliding of the bolts. The installation principle is that the hands cannot be shaken.



装配示意图一
Assembly diagram one



装配示意图二
Assembly diagram two



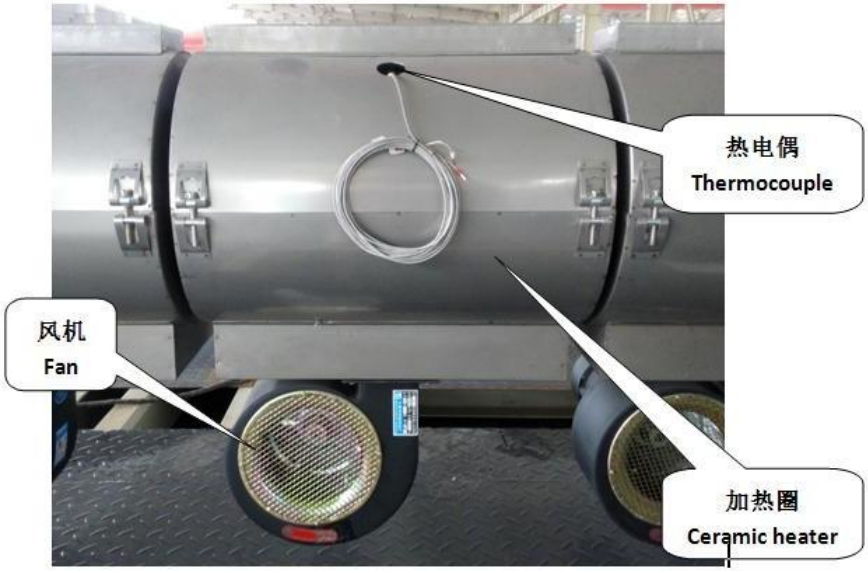
装配示意图三
Assembly diagram three

3.1.4.4.2、冷却风机 cooling fan

机筒冷却风机目前常用DF系列风机，DF系列风机为“多叶、前向、窄轮”式叶轮，具有流通面积大，加速型流道，在对流体强力加压的同时产生的涡流小等特点，具有风量大，风压高，噪音低，效率高等诸多优点，结构上采用优质钢板经先进工艺冲压后铆接、焊接而成，因此结构紧凑牢固、体积小、安装、维修方便。

The DF series fan is commonly used in the barrel cooling fan. The DF series fan is a “multi-leaf, forward, narrow wheel” impeller. It has a large flow area, an accelerating flow path, and a small eddy current generated when the fluid is strongly pressurized. Features: It has many advantages such as large air volume, high wind pressure, low noise and high efficiency. The structure is made of high-quality steel plate, which is riveted and welded by advanced technology. Therefore, the structure is compact and firm, small in size, convenient for installation and maintenance.

风机外形图Fan outline drawing



风机安装示意图Installation picture

3.1.4.4.3、加热圈与冷却风机的维护保养 Heating coil and cooling fan maintenance

加热圈和风机是维持挤出单元热平衡的重要部件，是挤出机稳定工作的保证，在每次升温时应该检查加热温控表显示温度与对应加热圈的实测温度的误差，如两者温度相差很大，就必须细查原因，根据实际情况分析处理。在机筒温度超出设定温度时，冷却风机将会启动，此时可以检查风机的工作情况。如发现问题，应及时排除。

The heating coil and the fan are important components for maintaining the thermal balance of the extrusion unit, and are the guarantee for the stable operation of the extruder. The temperature of the heating temperature control table and the measured temperature of the corresponding heating coil should be checked at each temperature rise, such as the temperature of the two. If the difference is very large, it is necessary to carefully investigate the cause and analyze and deal with it according to the actual situation. When the barrel temperature exceeds the set temperature, the cooling fan will start, and the fan can be checked at this time. If problems

are found, they should be eliminated in time.

3.1.4.5、冷却水套 Cooling water jacket

挤出机的加料口壳体装有冷水装置，依靠水冷却。冷水装置每半年用高压水清洗一次，以清除水套内杂质，提高冷却效果。冷却水套是机筒喂料段关键的零件，同时喂料段也是整个挤出机关键部件，直接影响到螺杆的运行状况，影响的挤出机的产量。所以喂料段需要严格控制，温度太高物料处于熔融堵料，温度太低不利于螺杆喂料的稳定。

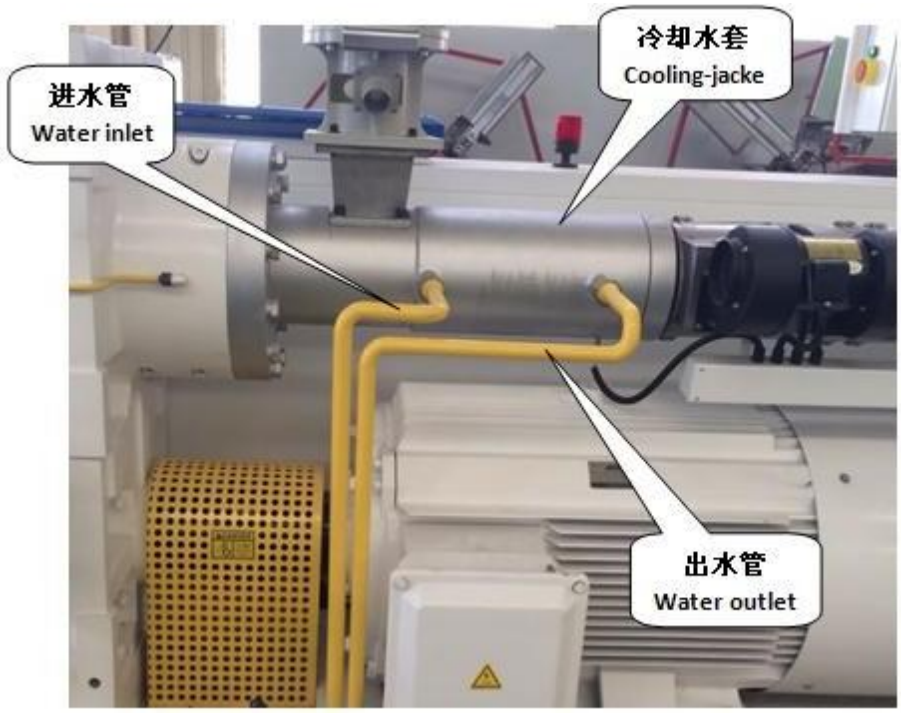
The feed port housing of the extruder is equipped with a cold water device and is cooled by water. The cold water device is washed once every half year with high-pressure water to remove impurities in the water jacket and improve the cooling effect. The cooling water jacket is the key part of the barrel feeding section, and the feeding section is also a key component of the entire extruder, which directly affects the operating condition of the screw and affects the output of the extruder. Therefore, the feeding section needs to be strictly controlled, the temperature is too high, the material is in the melt blocking material, and the temperature is too low, which is not conducive to the stability of the screw feeding.

挤出机冷却用水要求：Extruder cooling water requirements:

水的纯度： 无污染 无石灰质 Water purity: no pollution, no lime

水 压：0.5－0.9MPa Water pressure: 0.5-0.9MPa

水 温：10－20℃ Water temperature: 10-20°C



单螺杆挤出机冷却水套 Single screw extruder cooling water jacket

3.1.4.6、联轴器的维护保养 Coupling maintenance

联轴器在长时间的运转中会因设备的振动，而使电机和减速箱相对位置的产生改变，从而导致联轴器的错位、弹性体磨损，影响传动的平稳。所以，每隔3个月就应检查联轴器的同轴度、弹性体的磨损情况，以便调整联轴器或更换弹性体。

During the long-term operation, the coupling will change the relative position of the motor and the reduction box due to the vibration of the equipment, which will cause the misalignment of the coupling and the wear of the elastic body, which will affect the smoothness of the transmission. Therefore, the coaxially of the coupling and the wear of the elastomer should be checked every 3 months in order to adjust the coupling or replace the elastomer.

注意：在使用过程中禁止拆开防护罩，以免转动部件伤人!
在检修过程中拆开防护罩后，检修完成时请务必装好防护装置！
Note: It is forbidden to disassemble the protective cover during use to avoid injury to the rotating parts!
After disassembling the protective cover during the maintenance process, be sure to install the protective device when the repair is completed!

3.1.4.6.1、梅花联轴器的安装：Plum coupling installation:

- 安装前应首先检查电机和齿轮箱两轴是否同心，两轴表面是否有碰伤，梅花联轴器两个半联轴节内孔是否有杂物，内孔棱边是否有碰伤、如有应将轴、半联轴节清理干净，碰伤用细锉处理好，然后检查两个半联轴节的内孔直径和长度是否同电机、齿轮箱的直径和轴伸长度尺寸相符，通常情况下，电机和齿轮箱端半联轴节长度小于其轴伸长度2mm。
  Before installation, first check whether the two shafts of the motor and the gearbox are concentric. Is there any bump on the surface of the two shafts? Is there any debris in the inner holes of the two coupling joints of the plum coupling? Is there any bump on the edge of the inner hole? The shaft and the half coupling should be cleaned, the bumps should be treated with fine boring, and then the diameter and length of the inner diameter of the two coupling halves should be checked to match the diameter of the motor, the gearbox and the shaft elongation. Normally The motor and gearbox end half coupling length is less than 2 mm of its shaft elongation.
- 为了便于安装，最好是将两个半联轴节放在 120—150℃的保温箱或油槽中进行预热，使内孔尺寸涨大方便装入。安装后保证轴头不能凸出半联轴节端面，以齐平为好。检测两半联轴节之间的距离：沿半联轴节的法兰盘两内侧测出 3--4点的读数取平均值，及加长段与两个膜片组实测尺寸之和，两者误差控制在 0—0.4mm范围之内。
  In order to facilitate the installation, it is preferable to preheat the two semi-couplings in an incubator or oil tank of 120-150 ° C, so that the inner hole size is increased and the loading is convenient. After installation, it is guaranteed that the shaft head cannot protrude from the end face of the coupling half, so that it is flush. Detect the distance between the two halves of the coupling: take the average of the readings of the 3--4 points on both sides of the flange of the half-coupling, and the sum of the length of the extended section and the two diaphragm sets, two The error is controlled within the range of 0-0.4mm.
- 找正：用百分表检测两半联轴节法兰盘端面和外圆跳动，当法兰盘外圆小于 250mm时跳动值应不大于 0.05mm；当法兰盘外圆大于 250mm时，跳动值应不大于 0.08mm。
  Correction: Use the dial indicator to detect the end face and outer circle runout of the two coupling halves. When the outer circle of the flange is less than 250mm, the runout value should be no more than 0.05mm; when the outer circle of the flange is larger than 250mm,

the runout The value should be no more than0.08mm.

- 实践证明，如按说明及要求进行安装、维护、操作、梅花联轴器的日启动次数在1--5次,弹性垫的使用寿命最少 3年以上，如不按要求进行安装、维护、操作，原动机与工作机两轴轴心偏移过大都会使弹性垫提前损坏。
  Practice has proved that if the installation, maintenance and operation according to the instructions and requirements are performed, the number of daily starts of the plum coupling is 1-5 times, and the service life of the elastic pad is at least 3 years. If it is not installed, maintained or operated as required. If the prime mover and the working machine are offset too much, the elastic pad will be damaged in advance.

3.1.4.6.2、梅花联轴器的拆卸 Disassembly of plum coupling：

- 在梅花联轴器拆卸前，要对联轴器各零部件之间互相配合的位置作一些记号,以作复装时的参考；
  Before the disassembly of the plum blossom coupling, make some marks on the positions where the components of the coupling cooperate with each other for reference during reassembly;
- 在梅花联轴器拆卸过程中，最困难的工作是从轴上拆下轮毂。对于键联接的轮毂，一般用三脚拉马或四脚拉马进行拆卸。选用的拉马应该与轮毂的外形尺寸相配，拉马各脚的直角挂钩与轮毂后侧面的结合要合适，在用力时不会产生滑脱想象。这种方法仅用于过盈比较小的轮毂的拆卸，对于过盈比较大的轮毂，经常采用加热法，或者同时配合液压千斤顶进行拆卸；Duringthe disassembly of the plum coupling, the most difficult task is to remove the hub from the shaft. For the keyed hub, it is usually disassembled with a three-legged puller or a four-legged puller. The selected puller should match the outer dimensions of the hub. The right angle hook of each leg of the puller should be combined with the rear side of the hub, and there is no slippage imagination when exerting force. This method is only used for the disassembly of the hub with relatively small interference. For the hub with relatively large interference, the heating method is often used, or the hydraulic jack is used for disassembly at the same time;
  三角拉马如图： Triangle pull horse as shown:

- 对梅花联轴器的全部零件进行清洗、清理及质量评定是联轴器拆卸后的一项极为重要的工作。零部件的评定是指每个零部件在运转后，其尺寸、形状和材料性质的现有状况与零部件设计确定的质量标准进行比较，判定哪一些零部件能继续使用，哪一些零部件应修复后使用，哪一些属于应该报废更新的零部件。
  Cleaning, cleaning and quality assessment of all parts of the plum coupling are an extremely important task after the coupling is disassembled. The evaluation of parts means that after each part is in operation, the existing condition of its size, shape and material properties is

compared with the quality standard determined by the part design to determine which parts can continue to be used, and which parts should be Used after repair, which are parts that should be scrapped and up dated.

3.1.5、挤出单元的安全保护 Extrusion unit safety protection

挤出机在正常工作时，存在高温和高速转动的危险。在接近高温部件作业时，需穿戴防高温服、防高温手套，以及穿防滑靴。电机与减速箱连接部分是高速旋转的联轴器，在联轴器罩不再正常位置或没有牢固地固定在机架上，不允许启动挤出机。

There is a danger of high temperature and high speed rotation during normal operation of the extruder. Wear high temperature clothing, high temperature resistant gloves, and non-slip boots when working near high temperature parts. The motor and the gearbox connection part is a high-speed rotating coupling. When the coupling cover is no longer in the normal position or is not firmly fixed to the frame, the extruder is not allowed to start.

3.2、换网单元基本参数、液压站及安全操作指导 Screen changer unit basic parameter、hydraulic station and safety instruction

液压换网系统广泛应用于各类塑料制品挤出，塑胶制粒等领域，完美的设计和精心的制作让产品的性能值得信赖，多种可供选择的结构形式和规格型号，最大程度满足客户的需求。PE 所使用的换网器为双工位板式换网器，该换网器主要有以下优点：

The hydraulic screen changing system is widely used in various plastic products extrusion, plastic granulation and other fields. The perfect design and meticulous production make the performance of the products reliable, and a variety of structural forms and specifications can be selected to satisfy the customers. Demand. The screen changer used in PE is a double-station plate type screen changer. The screen changer mainly has the following advantages:

- Ø 无机械密封结构，保证在高压、高温状态下不渗料。有效降低换网阻力，减小液压系统的工作压力
  There is no mechanical seal structure to ensure no bleeding under high pressure and high temperature conditions. Effectively reduce the resistance to changing the net and reduce the working pressure of the hydraulic system
- Ø 优质合金钢经氮化处理，大幅延长产品使用周期；
  High-quality alloy steel is nitride to greatly extend the product lifecycle;
- Ø 整体式工程油缸，使用寿命更长久；
  The integral engineering cylinder has a longer service life;
- Ø 交替式工作模式，能保证在换网过程中的料流连续、稳定以及工艺参数的可重复性；
  Alternate working mode ensures continuous and stable flow during the changing process and repeatability of process parameters;
- Ø 经过流变优化后的蜂窝板，有效降低了挤出过程中流体剪切；
  The theologically optimized honeycomb panel effectively reduces fluid shear during extrusion;

3.2.1、换网单元的基本组成 Basic composition of the network change unit

换网器主要由换网器本体、闸板、金属过滤网、多孔板、液压缸组成。具体如下图：

The screen changer is mainly composed of a screen changer body, a shutter, a metal filter mesh, a perforated plate and a hydraulic cylinder. Specifically as shown below:

3.2.2、换网器使用说明 Screen changer instructions

在工作区域内可放置不同目数和数量的过滤网，放置的网片数及目数对挤出压力和流量有直接影响，操作者可根据自己的实际生产情况而定。在换网器正常工作过程中，随着滤网前杂质的积累，压力会慢慢上升，当达到一定压力时我们需要进行换网操作（可

根据自己的生产经验决定换网压力，但换网压力建议低于 16MPa），具体操作步骤如下：

Filters of different meshes and quantities can be placed in the work area. The number of meshes and meshes placed have a direct influence on the extrusion pressure and flow rate, and the operator can decide according to their actual production conditions. During the normal operation of the screen changer, the pressure will gradually rise with the accumulation of impurities before the filter. When a certain pressure is reached, we need to change the network operation (the network pressure can be changed according to our own production experience, but the network is changed. The pressure is recommended to be less than 16 MPa). The specific steps are as follows:

- 启动液压站、调节压力阀使液压站的系统压力达到 16Mpa左右；
  Start the hydraulic station and adjust the pressure valve to make the system pressure of the hydraulic station reach about16Mpa;
- 待液压站系统压力稳定后，按下液压缸启动按钮；
  After the pressure of the hydraulic station system is stable, press the hydraulic cylinder start button;
- 液压缸到位后，用铜铲将需要更换的滤网铲除，并去除柱塞上的遗留熔体；
  After the hydraulic cylinder is in place, use a copper shovel to remove the filter that needs to be replaced and remove the remaining melt from the plunger;
- 将事先准备好的滤网装入网孔，按压平整；
  Insert the prepared filter into the mesh and press it flat;
- 关闭液压站
  Turn off the hydraulic station.

注意事项：换网时滑柱运动很快，并且会存在少量高温熔体流出，所以换网过程中存在高温烫伤危险，因此换网过程中，操作人员不得处于滑柱下方，在换网结束后，应快速更换滤网并清理滑柱熔融物料，清理物料时必须戴耐高温手套。

Note: When changing the net, the sliding column moves very quickly,and there will be a small amount of high temperature melt flowing out. Therefore, there is a danger of high temperature burn in the process of changing the net. Therefore, during the network changing process, the operator must not be under the sliding column. The filter should be quickly replaced and the molten material of the spool should be cleaned. High temperature gloves must be worn when cleaning the material.

型号 Model	产量kg/h Output	滤网规格mm Filter size	过滤面积m㎡ Filtration area	最高承压Mpa Withstanding pressure	温控分区 Heating zone	加热功率 Heating power
JW-SZ-50	50-150	Φ55	1960*2	40	2	7.5
JW-SZ-70	80-150	Φ75	3850*2	40	2	7.5
JW-SZ-100	150-380	Φ105	7850*2	35	2	9
JW-SZ-120	350-700	Φ125	11300*2	30	2	13.5
JW-SZ-150	400-1000	Φ155	17670*2	28	2	15
JW-SZ-180	700-1500	Φ185	25440*2	25	2	18

3.2.3、液压站主要参数和使用说明 Hydraulic station main parameters and instructions for use

3.2.3.1、概述 Overview

本液压系统采用了蓄能器以在短时间内供应大量的压力油，实现系统的快速运动。采用手动换向阀实现系统执行元件的不同方向的运动。

The hydraulic system uses an accumulator to supply a large amount of pressure oil in a short time to achieve rapid movement of the system. Manual reversing valves are used to effect

movement of the system actuators in different directions.

3.2.3.2、主要技术参数 The main technical parameters

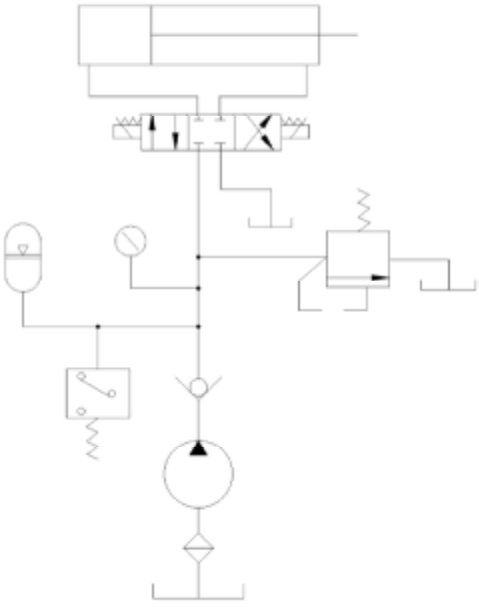
系统最大压力：16MPa（蓄能器限压）

Maximum system pressure: 16MPa (accumulator limit)

控制回路电压：220V

Control loop voltage: 220V

3.2.3.3、液压站结构图以及其工作原理图 Hydraulic station structure diagram and its working principle diagram



液压原理图 Hydraulic principle diagram

3.2.3.4、液压站使用说明 Hydraulic station instructions

- 首次使用前准备工作 Prepare for the first time

Ø 首先加入液压站规定的工作介质，加入时应经过过滤器，过滤器精度不得低于液压站设计规定的过滤精度。注入油量 70L～80L为宜，也可视液位计，油位应位于液位计 80%左右。介质建议使用 46号抗磨液压油，清洁度为 8-9级（NAS1638）25～54CST，实际使用可参考《机械设计手册》第五卷《介质》篇章。不能混合使用不同种类的液压油。

Firstly, the working medium specified by the hydraulic station is added. When it is added, it

should pass through the filter. The accuracy of the filter should not be lower than the filtration precision specified by the hydraulic station design. It is advisable to inject oil from 70L to 80L, and it can also be regarded as a liquid level gauge. The oil level should be located at about 80% of the liquid level gauge. The medium is recommended to use No. 46 anti-wear hydraulic oil, the cleanliness is 8-9 (NAS1638) 25 ~ 54CST, the actual use can refer to the "Mechanical Design Handbook" fifth volume "Media" chapter. It is not possible to mix different types of hydraulic oil.

Ø 按照原理图安装好液压系统，确认无误。接入电源线时应注意电机的旋转方向。开机前，先用手转动电机，确定无故障后，点动电机，待确定电机旋向正确后，才能正式启动电机。（以电机或泵上的旋向标志为准）

Install the hydraulic system according to the schematic diagram and confirm that it is correct. Pay attention to the direction of rotation of the motor when connecting the power cord. Before starting the machine, first turn the motor by hand to make sure that there is no fault, then jog the motor. After the motor is correctly rotated, the motor can be officially started. (subject to the direction mark on the motor or pump)

Ø 调试，调节压力继电器至工作压力，注意压力继电器的工作压力不得高于蓄能器的限压（本液压站系统蓄能器限压为 16MPa），并调节溢流阀压力使其压力高于压力继电器设定压力的5%。调节系统压力时，应先调节溢流阀的压力，再调节压力继电器的压力，调节溢流阀压力时，压力继电器应先断电再调节，根据实际需要按调节手柄上的压力增减指示标识，左旋或右旋以调低或调高系统压力以满足要求。调整完毕后，按照上述的调节方法调节压力继电器，溢流阀的压力应高于压力继电器设定压力的5%。

Commissioning, adjust the pressure relay to the working pressure, pay attention to the working pressure of the pressure relay should not be higher than the limit pressure of the accumulator (the pressure limit of the accumulator of the hydraulic station system is 16MPa), and adjust the pressure of the relief valve to make the pressure high. Set the pressure to 5% of the pressure relay. When adjusting the system pressure, the pressure of the relief valve should be adjusted first, then the pressure of the pressure relay should be adjusted. When the pressure of the relief valve is adjusted, the pressure relay should be powered off and then adjusted. According to the actual needs, press the pressure increase and decrease indicator on the adjustment handle, left or right hand to lower or increase the system pressure to meet the requirements. After the adjustment is completed, adjust the pressure relay according to the above adjustment method. The pressure of the relief valve should be higher than 5% of the pressure relay setting pressure.

² 开机前空转5～10分钟，然后调节泵的压力，调节时需慢慢将压力升高，待压力至工作压力稳定后，锁紧调压螺母。

Idling for 5 to 10 minutes before starting, then adjust the pressure of the pump. When adjusting, slowly increase the pressure. After the pressure reaches the working pressure, lock the pressure regulating nut.

² 不工作时换向阀要回到中位，油缸处于轻载状态。

The reversing valve should return to the neutral position when it is not working, and the cylinder is in a light load state.

² 停机四小时以上时，应空载运行 5～10分钟，再加载运行。

When the machine is stopped for more than four hours, it should be run for 5 to 10 minutes at no load and then loaded and run.

l 使用说明 Instructions for use

Ø 当需要液压站工作时，请先看压力表的压力显示是否达到工作要求，如果压力小于工作压力，请接通电源，按下电磁启动器启动按钮（绿色）以启动电机和泵对蓄能器蓄能，

当压力达到设定值时，压力继电器会自动发出信号使电机停止工作。
When the hydraulic station needs to work, please check the pressure of the pressure gauge to see if it meets the working requirements. If the pressure is less than the working pressure, please turn on the power and press the electromagnetic starter start button (green) to start the motor and pump. The energy storage device, when the pressure reaches the set value, the pressure relay will automatically send a signal to stop the motor.

- Ø 按下电控箱上的电磁阀启动按钮使其至左位或右位（视实际液压缸的接入状态和工作需要而定）。
  Press the solenoid valve start button on the electric control box to the left or right position (depending on the actual hydraulic cylinder access status and work needs).
- Ø 当执行元件达到指定位置后，按下电磁换向阀的复位按钮使其回到中位，为下一个工作循环做准备。
  When the actuator reaches the specified position, press the reset button of the solenoid reversing valve to return it to the neutral position to prepare for the next working cycle.
- Ø 切断电源 cut off the power

3.2.3.5、系统维护 system maintenance

- 未停机停电泄压时禁止检修；
  It is forbidden to repair when the power is not stopped and the power is released.
- 更换密封件时不得使用锐器，不得损伤损坏密封件；
  Do not use sharps when replacing seals, and do not damage damaged seals;
- 不允许在蓄能器上进行焊接和加工，维修不当可能造成重大事故，如检查是蓄能器的问题应及时送回制造厂修理；
  Welding and processing on the accumulator are not allowed. Improper maintenance may cause major accidents. If the inspection is an accumulator, it should be promptly returned to the manufacturer for repair;
- 电机维修时注意接线顺序，保证电机的实际旋转方向和标示方向一致；
  Pay attention to the wiring sequence when repairing the motor to ensure that the actual rotation direction of the motor is consistent with the marking direction;
- 随时检查系统压力是否稳定在规定范围内；
  Check whether the system pressure is stable within the specified range at any time;
- 注意系统工作时有无异常响声；
  Pay attention to whether there is abnormal noise when the system works;
- 本液压系统安装时应特别注意避免热能的污染。油温是否在规定的范围内（30℃～55℃），一般不得超过 60℃。若油温过高应停机查找原因；
- When installing this hydraulic system, special care should be taken to avoid contamination of thermal energy. Whether the oil temperature is within the specified range (30 ° C ~ 55 ° C), generally not more than 60 ° C. If the oil temperature is too high, stop the machine to find the reason;
- 电源电压应保持稳定，其波动值不超过额定电压的 15%；
  The power supply voltage should be stable and its fluctuation value should not exceed 15% of the rated voltage;
- 定期检查液压站运转情况及泄漏油情况，液位低于油标的 80%时要及时补油；
  Regularly check the operation of the hydraulic station and the leakage of oil. When the liquid level is lower than 80% of the oil mark, it should be replenished in time;
- 定期更换工作介质（第一次为半年，以后每年一次）和滤芯，滤芯视工作、环境和堵塞情况而定，一般为 3～6个月；
  Regularly change the working medium (the first time is half a year, once a year later) and the

filter element. The filter element depends on the work, environment and blockage, usually 3 to 6 months;

- 不能在无压力表的情况下调节压力，压力表损坏后要及时更换；
  The pressure cannot be adjusted without a pressure gauge, and the pressure gauge should be replaced in time after it is damaged;
- 及时处理系统的内外泄漏；
  Handling internal and external leaks of the system in a time lymanner;
- 电气控制系统保持清洁干燥；
  The electrical control system remains clean and dry;
- 拆装液压元件时，要保持元件清洁，防止灰尘、异物污染液压油；
  When disassembling and installing hydraulic components, keep the components clean to prevent dust and foreign matter from contaminating the hydraulic oil;
- 检修完毕确认无误后进行开机调试。操作步骤应严格按照使用说明；
  Start debugging after the inspection is completed. The operation steps should be strictly in accordance with the instructions for use;
- 任何不正当的维修和操作所引起的系统元件损坏或者系统故障，本公司将不负任何责任。
  The company will not be responsible for any damage to the system components or system failure caused by improper maintenance and operation.

3.2.3.6、注意事项 matters needing attention

- 油温过高（大于 60℃）或过低（小于 15℃）应停止使用；
  If the oil temperature is too high (more than 60 °C) or too low (less than 15 °C), it should be stopped;
- 油箱中油量过少应停止使用；
  If the oil quantity in the fuel tank is too small, stop using it;
- 如果出现喷油或泄漏严重，严禁在工作中维修；
  If oil injection or leakage is serious, it is strictly forbidden to repair at work;
- 液压系统出现故障时，应及时通知维修人员维修，不得带故障操作；
- When the hydraulic system fails, it should be promptly notified to the maintenance personnel for maintenance, and must not be operated with faults;
- 系统尽量避免带负载启动。
  The system tries to avoid starting with load.

3.2.3.7、常见故障与排除 common faults and troubleshooting

- 系统无压力或压力异常；The system has no pressure or abnormal pressure;
- 检查电机旋向是否正确；Check if the motor rotation is correct;
- 检查溢流阀调压是否正常；Check if the pressure regulating valve is normal;
- 检查压力继电器是否正常；Check if the pressure relay is normal;
- 检查油箱油液是否有足够量（看液位计）；Check if there is enough oil in the tank (see the level gauge);
- 检查油泵是否工作正常；Check if the oil pump is working properly;
- 系统内外泄漏严重；Serious leakage inside and outside the system;
- 检查液压油中是否混入空气；Check if air is mixed in the hydraulic oil;
- 检查蓄能器是否失效；Check if the accumulator is invalid;
- 吸油管或滤油器堵塞可引起系统压力不足；Blockage of the suction pipe or oil filter can cause insufficient system pressure;
- 系统噪声和振动大；System noise and vibration are large;

- 电机振动，轴承磨损引起振动；Motor vibration, bearing wear causes vibration;
- 系统管路松动引起振动和噪声；The looseness of the system piping causes vibration and noise;
- 油泵吸入空气时会产生噪声；The oil pump generates noise when it takes in air;
- 阀换向引起的压力急剧变化和生产的液压冲击等产生的管路冲击噪声和振动；Pipeline impact noise and vibration caused by sudden changes in pressure caused by valve commutation and hydraulic shock generated by the production;
- 系统温度过高；The system temperature is too high;
- 周围环境温度高，散热不好；The ambient temperature is high and the heat dissipation is not good;
- 油液型号不当、粘度大则粘性阻力大，粘度小则泄漏量大；If the oil type is improper, the viscosity is large, the viscous resistance is large, and the viscosity is small, the leakage is large;
- 油泵吸油不畅或系统回油不畅，过滤器堵塞；The oil pump is not well absorbed or the system is not returning oil and the filter is clogged;
- 油泵内泄漏大；Large leakage in the oil pump;
- 油缸不动作或爬行；The cylinder does not move or crawl;
- 检查系统压力是否正常；Check if the system pressure is normal;
- 换向阀是否工作正常；Whether the reversing valve is working properly;
- 系统中混入空气产生爬行；Air mixed into the system creates crawling;
- 机械方面是否卡死。 Whether the machine is stuck.

3.2.3.8、定期检查和维护 Regular inspection and maintenance

检查项目 Check item	检查周期 inspection cycle	检查方法及标准 Inspection methods and standards
泵的噪声 Pump noise	1/季season	一般的标准 7Mpa≤75db(A)、14Mpa≤90db(A)使用噪声检测仪General standard 7Mpa≤75db(A), 14Mpa≤90db(A) Use noise detector
压力表压力测量 Pressure gauge pressure measurement	1/年year	用标准表检测Check with standard meter
蓄能器充气压力 Accumulator charging pressure	1/年year	用带压力表的充气装置检测，检测标准应保持规定压力Use an inflator with a pressure gauge to test, the test standard should maintain the specified pressure
油液的污染状况 Contamination status of oil	1/季season	用专用仪器检测，检测标准按NAS1638或ISO4406标准应在9级以上Use special equipment for testing, the testing standard should be above level 9 according to NAS1638 or ISO4406
油箱液位Fuel tank level	1/季season	目视液位计，标准液位不得低于液位计80％ Visual level gauge, the standard level shall not be lower than 80% of the level gauge

3.3、模具基本参数及安全操作指导 Mold basic parameter and safety instruction

3.3.1、安全 Security

3.3.1.1、特别安全说明

1、只有经过培训合格的人员才能操作模头。
2、操作前应详细阅读说明手册，理解控制和调节功能。
3、注意贴在各部件上的警告标志。
4、配戴合适的防护眼罩及合适的防护服
5、正确地使用维护工具。
6、高温的熔体或气态原料可能会溢出，不要靠近高温工作或正在加温的设备；工作时，严禁站在模头的正前方。
7、对设备实施恰当的保养和维护。拆装时，不允许任何金属包括手镯、扳手等接触型腔表面，以免划伤抛光的型腔表面，请采取必要的保护措施。
8、所使用的电线和电源参数应满足要求，应由有资格的电工来安装电气件，并且要符合电气技术规则。
9、严禁在检修电路过程中接通电源。
10、不要移走任何安全装置，检修设备完成时应放回所有的安全警告标识。
11、在启动主机之前，先要知道急停装置的位置（指主机）。
12、每隔一定的时间要检查急停装置的功能。
13、在开始启动时，要保证所有的机器部件完全符合条件。
1. Only trained and qualified personnel can operate the mold.
2. Read the instruction manual carefully before operation to understand the control and adjustment functions.
3. Pay attention to the warning signs attached to each component.
4. Wear suitable protective goggles and suitable protective clothing
5. Use maintenance tools correctly.
6. High-temperature melt or gaseous raw materials may overflow. Do not approach high-temperature working or heating equipment; it is strictly forbidden to stand in front of the mold when working.
7. Implement proper maintenance and maintenance of the equipment. When disassembling, do not allow any metal including bracelets, wrenches, etc. to touch the surface of the cavity to avoid scratching the surface of the polished cavity. Please take necessary protective measures.
8. The wires and power parameters used should meet the requirements, and the electrical parts should be installed by qualified electricians, and they should comply with electrical technical rules.
9. It is strictly forbidden to switch on the power supply during circuit maintenance.
10. Do not remove any safety devices, and put back all safety warning signs when the equipment is overhauled.
11. Before starting the Extruder, you must know the location of the emergency stop device (referring to the Extruder).
12. Check the function of the emergency stop device at regular intervals.
13. At the beginning of the start-up, ensure that all machine parts are fully qualified.

3.3.1.2、专用性说明 Specificity description

1.本设备是为销售合同技术协议中所提及的技术要求而专门设计的，包括所使用的物料，生产制品的规格等，对于用户超出技术协议的操作和使用，本公司将不负任何责任。
1. This equipment is specially designed for the technical requirements mentioned in the

technical agreement of the sales contract, including the materials used, the specifications of the produced products, etc., for the user's operation and use beyond the technical agreement, the company will not be responsible for any responsibility.

2.未经本公司同意对模头所作的任何修改，本公司将不负任何责任。

2. The company will not take any responsibility for any modification made to the mold without the consent of the company.

3.该设备必须由经过相关操作培训或持有资格证书的操作人员使用。

3. The equipment must be used by operators who have passed relevant operation training or hold qualification certificates.

3.3.1.3、安全标识说明 Safety mark description

为了提醒操作人员在操作过程中避免造成人身伤害，本设备在许多有人身伤害危险的部位张贴了相应的安全警告标志，请在生产和调试，以及保养维护的过程中，不要把这些安全警示标志移位，在拆卸修理机器时，需要移动或者拆下某些标志，请在完成相应的工作之后，将它们安装回原来的位置。

In order to remind the operator to avoid personal injury during the operation, the equipment has posted corresponding safety warning signs on many parts where personal injury is dangerous. Please do not put these safety warning signs during production, debugging, and maintenance. When disassembling and repairing the machine, some signs need to be moved or removed. Please install them back to their original positions after completing the corresponding work.

以免因为地区和国家在安全警示标志意义上的差别，在此特别解释本生产线上的安全警示标志的具体意义，请操作人员在操作机器之前，先了解以下这些安全警示标志的意义。

In order to avoid differences in the meaning of safety warning signs between regions and countries, here is a special explanation of the specific meaning of the safety warning signs on this production line. Please understand the meaning of the following safety warning signs before operating the machine.

注意！当接通电源后禁止打开任何电线盖、电线管和插头，不然操作者有触电的危险！note! It is forbidden to open any wire covers, conduits and plugs after the power is turned on, otherwise the operator may have the risk of electric shock!

设备温度较高,操作时请戴防高温手套！The temperature of the equipment is high, please wear high temperature gloves when operating!

设备温度较高，操作时要穿防高温服！The temperature of the equipment is high, please wear high temperature cloth when operating!

注意！ 此处温度极高，操作时，要注意安全，防止烫伤！
note! The temperature here is extremely high. When operating, pay attention to safety to prevent burns!

3.3.2、运输和安装 Transparent and installation

3.3.2.1、运输 Transparent

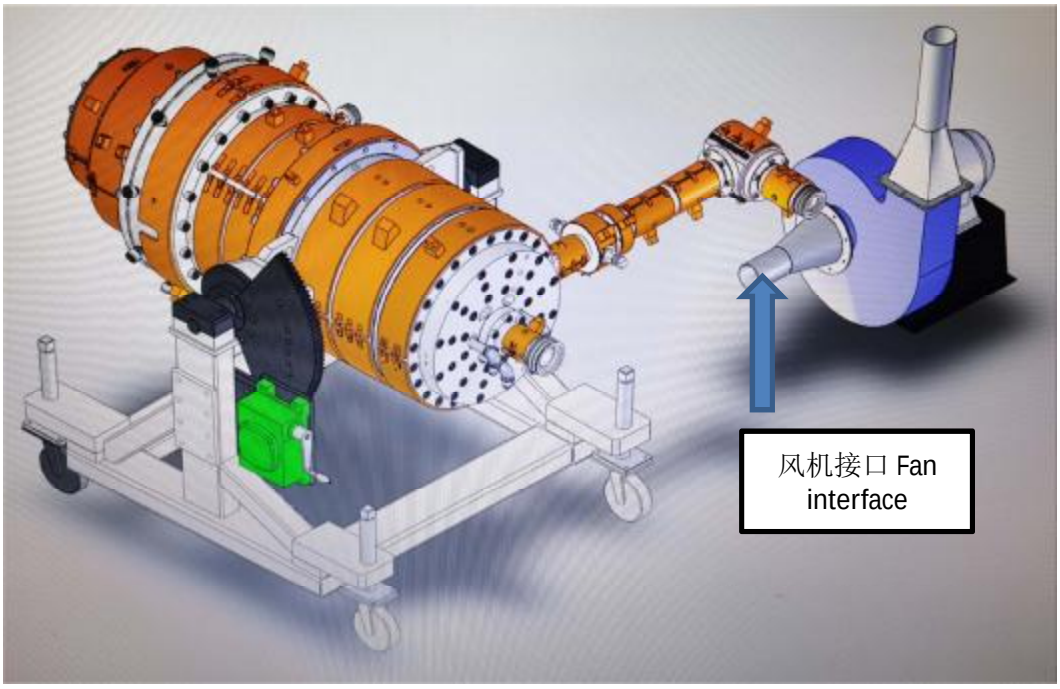
设备在运输前已经严格检查和包装，当在运输过程中仍有可能会遭到损坏，收到设备时应检查是否与发货清单一致，包装是否完好，如果包装受到损坏：检查设备的外观是否损坏，对损坏部位进行拍照记录，如果设备在运输过程中受到损坏，尽快联系营运商保存好原包装材料（营运商可能要检查包装材料，也便于营运商将设备运回本公司接受检查），需运回我公司检查时请尽量使用原包装件和原始包装材料。如过上述的包装件都不可用，应使用专用包装件。将本设备的每个部件装入与原始包装件类似的木箱中，木箱应能够承受部件的相应重量（部件应放在同一个木箱内，以防遗失），如果对你设备的运输包装和保护有任何疑问，请向我公司咨询。The equipment has been strictly inspected and packaged before transportation. It may still be damaged during transportation. When receiving the equipment, check whether it is consistent with the delivery list and whether the packaging is intact. If the packaging is damaged: check the appearance If the equipment is damaged during transportation, contact the operator as soon as possible to save the original packaging materials (the operator may need to check the packaging materials, and it is also convenient for the operator to transport the equipment back to the company for inspection), Please use the original packaging and original packaging materials when you need to ship it back to our company for inspection. If none of the above packages are available, special packages should be used. Put each component of the device in a wooden box similar to the original package. The wooden box should be able to bear the corresponding weight of the component (the component should be placed in the same wooden box to prevent loss). If you transport your device If you have any questions about packaging and protection, please consult our company.

3.3.2.2、用叉车运输 Transport by forklift

- 叉车操作员必须是经过培训并取得操作许可证的；
- 注意模头的重心；
- 叉起模头时，所有人员需立即离开危险区
- Forklift operators must be trained and obtain operating permits;
- Pay attention to the center of gravity of the mold;
- All personnel must leave the danger zone immediately when forkping the mold

3.3.2.3、模具的吊运 Mould lifting

- 起重操作员必须是经过培训并取得操作许可证的；
- 吊起模头时，所有人员需立即离开危险区域；
- 不能使用已受损的绳索或链条；
- 不能超过绳索或链条所能承受的负荷；
- 由于模头重量分布不平衡会导致搬运过程中的重心偏移，为防止吊索在吊钩中滑动，套在吊钩中的绳索必须在钩上再多绕一圈。
- Lifting operators must be trained and obtained operating permits;
- When lifting the mold, all personnel must leave the dangerous area immediately;
- Do not use damaged ropes or chains;
- Can not exceed the load that the rope or chain can bear;
- Due to the unbalanced weight distribution of the mold head, the center of gravity will shift during handling. In order to prevent the sling from sliding in the hook, the rope set in the hook must be wound around the hook one more time.



3.3.2.4、安装 Installation

1、禁止对模头作任何改动、附加、转换，以免削弱模头的安全性。
2、安装前要使发热件得到充分冷却。
3、操作者注意防止无意中碰到机器开关。
4、组装模头，要用高强度螺栓。
5、先关掉主开关，再拆开电线插头！

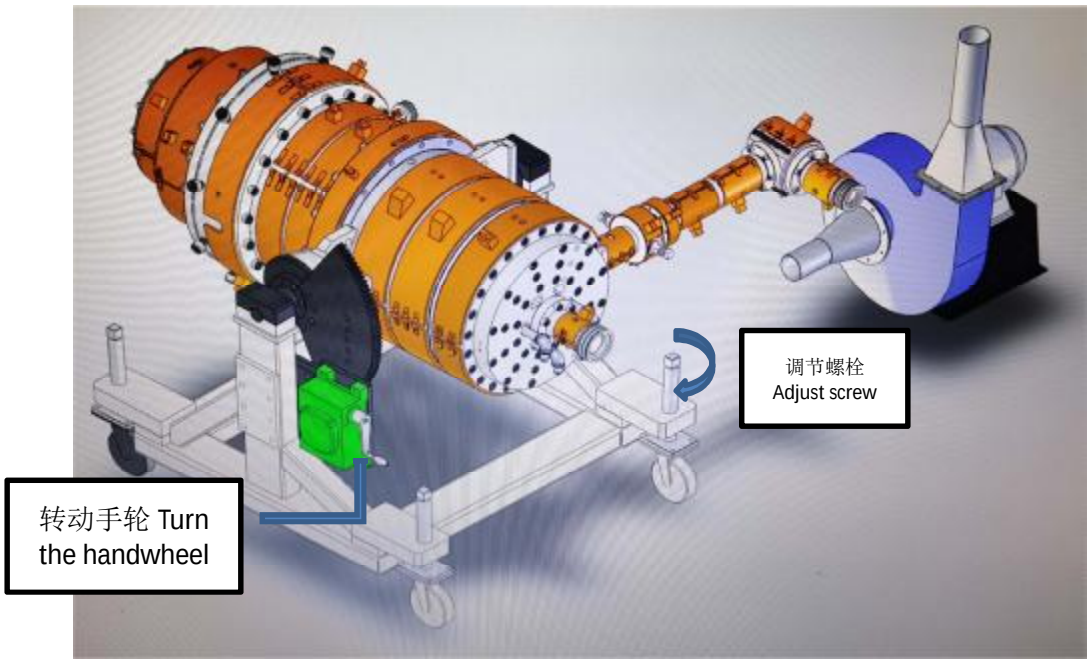
1. It is forbidden to make any changes, additions, or conversions to the mold, so as not to weaken the safety of the mold.
2. Before installation, the heating parts must be fully cooled.
3. The operator should pay attention to prevent accidentally touching the machine switch.
4. High-strength bolts are required to assemble the mold.
5. Turn off the main switch first, and then disconnect the wire plug!

3.3.2.5、储存 store

1、如果在到达后没有及时组装，一定要封好，放入干燥的地方，避免震动。

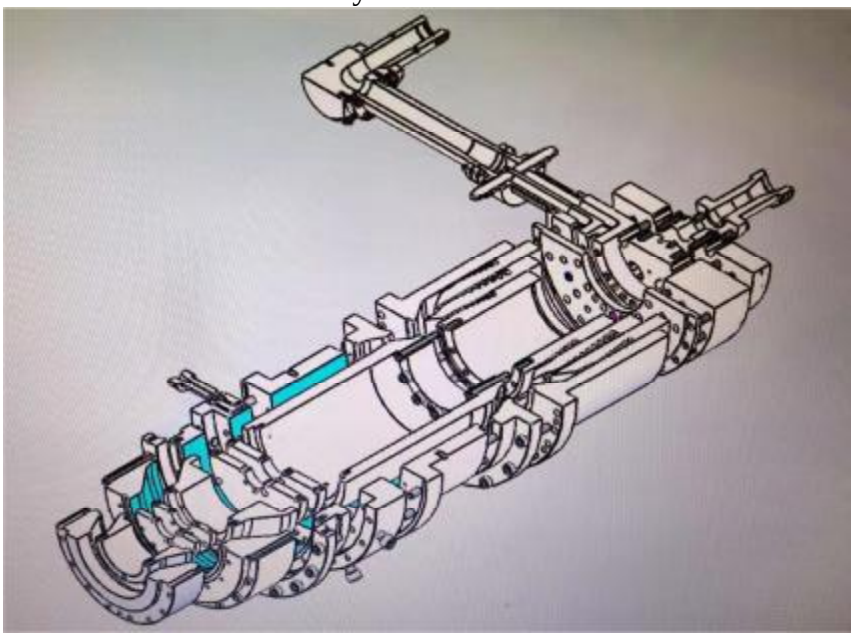
2、模头部件不要直接放在地上。
3、没有包装的部件不允许置于外面。
4、如果要长时间储存，这些零件要重新保护。
1. If it is not assembled in time after arrival, it must be sealed and placed in a dry place to avoid vibration.
2. Do not put the mold parts directly on the ground.
3. Unpackaged parts are not allowed to be placed outside.
4. If it is to be stored for a long time, these parts should be protected again.

3.3.3、模具操作说明 Mold Operation Instruction

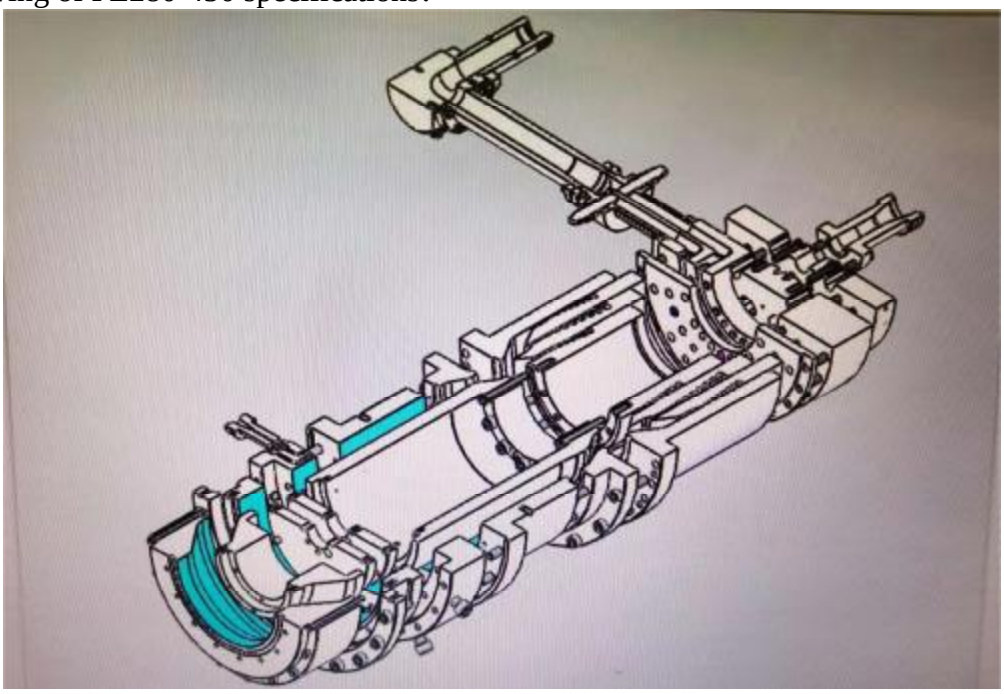


PE450单螺旋螺旋模具分解图如下The exploded view of PE450 single spiral spiral mold is as follows：

- PE110-250规格的模体的分解图和模具组装图The exploded view and mold assembly drawing of the PE110-250 model body：



- PE280-450规格的模体的分解图和模具组装图The exploded view and mold assembly drawing of PE280-450 specifications：



3.3.3.1、加热 Heating

当生产线已经全部安装完成,并且已经确保所有的人员和设备都处于安全范围内，就可以开机生产了。开机前，先将模头与主机加热约两小时，使模头温度达到约150ºC；然后在主机温控表上设置所需的生产温度，并保温一定时间。通常保温的时间长短可根据模头的大小而定，模体大的模头保温时间长，模体小的模头保温时间相对可以短些；但对于多层共挤的模头，为了使模头内外层温度均匀，应适当的延长保温时间。模头保温一段时间后，应通过调节螺钉来调整口模与芯棒之间的间隙，使模头对中。同时需重新拧紧受热的螺钉，推荐使用力矩扳手来拧紧螺钉，以防止泄露。最后用玻璃水银温度计校正温度，并检查加热区和加热器，热电偶及连线。

When the production line has been fully installed, and all personnel and equipment have been ensured to be in a safe range, it can start production. Before starting the machine, heat the mold head and the Extruder for about two hours to make the mold head temperature reach about 150^{o} C; then set the required production temperature on the Extruder temperature control table and keep it warm for a certain period of time. Generally, the length of the heat preservation time can be determined according to the size of the mold. The heat preservation time of the mold with a large mold body is longer, and the heat preservation time of the mold with a smaller mold body can be relatively short; The temperature of the inner and outer layers of the head is uniform, and the holding time should be extended appropriately. After the mold is kept warm for a period of time, the gap between the mold and the mandrel should be adjusted by adjusting the screw to center the mold. At the same time, it is necessary to re-tighten the heated screws. It is recommended to use a torque wrench to tighten the screws to prevent leakage. Finally, use a glass mercury thermometer to correct the temperature, and check the heating zone and heater, thermocouple and wiring.

3.3.3.2、启动 start up

当一切都已准备好之后，就可启动主机生产了。在开始启动时，最好先加入一些清

洗料，以防模头内产生高压，穿好工作服，戴防热手套。注意：在工作时不要站在模头正前方！注意操作方法，以防高压。

When everything is ready, you can start Extruder production. At the beginning, it is best to add some cleaning materials to prevent high pressure in the mold, wear work clothes and heat-resistant gloves. Note: Do not stand directly in front of the mold while working! Pay attention to the operation method to prevent high pressure.

3.3.3.3、生产 Production

根据生产出来的管胚的情况，调整生产的工艺温度，如果温度设置不对，将会影响挤出产品的表面质量。如果管材壁厚出现了偏差,可调节图中所示的调节螺钉调节来壁厚。注意:调节时,需先松开一边螺钉,才能调动另一边螺钉。

Adjust the production process temperature according to the conditions of the produced tube blanks. If the temperature is set incorrectly, the surface quality of the extruded product will be affected. If there is a deviation in the wall thickness of the pipe, the adjustment screw shown in the figure can be adjusted to adjust the wall thickness. Note: When adjusting, you need to loosen the screw on one side before moving the screw on the other side.

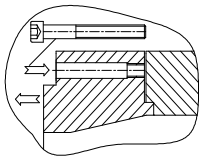
3.3.3.4、停机 Stop

停机时，统一降低挤出机的转速，如需清料，打开模头，清除余料；然后停止加热，关闭主开关。注意：先关掉主开关，再拆开电线插头！

When stopping, reduce the speed of the extruder uniformly. If you need to clean the material, open the mold head to remove the remaining material; then stop heating and turn off the main switch. Note: Turn off the main switch first, and then disconnect the wire plug!

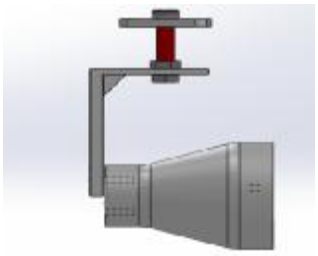
4.5 附属说明Attached note

为了方便模头的拆卸和装配，模头上特意的加了些工艺孔和一些拆装工具，下面就对此做些简单的介绍。In order to facilitate the disassembly and assembly of the mold head, some process holes and some disassembly tools are specially added on the mold head. Here is a brief introduction to this.



为了方便拆卸，可用相应的螺钉
将零件顶出。如左图所示
In order to facilitate disassembly, the corresponding screws can be used
Eject the part. As shown on the left

口模吊装（注意吊环承重极限）mold hoisting (pay attention to mit of the ring)



芯棒吊装工具 ：
吊装时需在吊装工具上垫纸板
（可保护芯棒防止碰伤等同类物品）
Mandrel lifting tool:
When hoisting, pad cardboard on the hoisting tool
(It can protect the mandrel from bumps and other similar items)

3.3.3.5、模头保养注意事项 Precautions for mold head maintenance

在日常生活中，对模具的正确的使用和拆卸就是对模具的最好的维修和保养。模具应趁热拆卸，避免冷却后无法拆卸。清理流道时必须使用软刮片或紫铜刷，将流道的残留树脂清理干净，也可以借用相关溶剂清理，切勿使用钢铁制器具。在装配前应检查流道的光洁度，对于较小的划痕应及时去除，较严重的损伤应送回厂家修理。模具装配前，要清理零件各部位毛刺，清洗干净。装配时，两零件结合面要紧密贴合，接缝处无凹凸台，应平滑过渡，无滞料死角。对于各连接、调整螺钉，在使用时应先涂上二硫化钼或硅油，便于高温状态下拆卸。而连接螺栓在紧固时，两对角螺栓应同时紧固，避免两连接零件端面不能紧密接触靠严。仔细检查模具是否装配正确。如模具暂时不用，装配模具时应涂防锈油，进料口要封好，避免杂物进入模腔内。模具芯部所用的冷却水应过滤和软化处理，每隔一段时间定时清理模具芯部冷却装置内的污垢，尤其是在使用不洁水源时，以防影响冷却效果。每次休息停产时都应由设备保养人员对设备各个连接螺丝和接头进行检查。

In daily life, the correct use and disassembly of the mold is the best repair and maintenance of the mold. The mold should be disassembled while it is hot to avoid being unable to disassemble after cooling. When cleaning the runner, you must use a soft scraper or a copper brush to clean the residual resin in the runner. You can also use related solvents for cleaning. Do not use steel appliances. The smoothness of the runner should be checked before assembling. Small scratches should be removed in time, and serious damage should be returned to the manufacturer for repair. Before the mold is assembled, the burrs on all parts of the parts should be cleaned and cleaned. When assembling, the joint surfaces of the two parts should be tightly fitted, and there should be no bumps at the joints, and the transition should be smooth, and there should be no dead corners of stagnant materials. For each connection and adjustment screw, molybdenum disulfide or silicone oil should be applied before use to facilitate disassembly under high temperature conditions. When the connecting bolts are tightened, the two diagonal bolts should be tightened at the same time to prevent the end faces of the two connecting parts from being in close contact. Check carefully whether the mold is assembled correctly. If the mold is not used temporarily, apply anti-rust oil when assembling the mold, and seal the material inlet to prevent debris from entering the mold cavity. The cooling water used in the mold core should be filtered and softened, and the dirt in the mold core cooling device should be cleaned regularly at regular intervals, especially when using dirty water sources to prevent affecting the cooling effect. The equipment maintenance personnel should check the connection screws and joints of the equipment every time the production is stopped.

3.3.3.6、结束语 Concluding remarks

本模头采用了物料螺旋分配原理，适合挤各种PO物料的管材。其显著的优势表现为以下几点This mold adopts the principle of material spiral distribution, which is suitable for extruding various PO materials. Its significant advantages are shown in the following points：

1、优化的螺旋分配流道确保熔融原料分配均匀；
2、顺畅的物料流动无死角，极低的压力损耗，同时更换颜色时流道能够快速清洁；
3、大容量的流道保证了充足的应力调整松弛时间，能制造出高品质的管材；
4、较低的熔体温度使管材的内应力降至最低；
5、坚固耐用，安装与拆装十分简便，使您用于清模与组装的时间减至最少；
6、方便共挤挤出，螺旋分配使得多层共挤变得跟更加均匀。同时，在单层的基础上稍加改动，即可实现外层涂覆；

1. Optimized spiral distribution channel ensures uniform distribution of molten materials;
2. Smooth material flow, no dead ends, extremely low pressure loss, and the flow channel can be quickly cleaned when changing colors;

3. The large-capacity runner ensures sufficient stress adjustment relaxation time and can produce high-quality pipes;
4. Lower melt temperature minimizes the internal stress of the pipe;
5. Rugged and durable, installation and disassembly are very simple, so that your time for mold cleaning and assembly is minimized;
6. Convenient co-extrusion, spiral distribution makes multi-layer co-extrusion more uniform. At the same time, the outer layer can be coated with a slight modification on the basis of a single layer;

由于本公司不断致力于产品的更新换代和开发，所以该说明书中提供的图表、说明、参数等与实际产品可能有所不符，具体以实物为准,图片仅供参考，不便之处尽请谅解。
As the company is constantly committed to product update and development, the diagrams, descriptions, parameters, etc. provided in this manual may not match the actual product. The specifics are subject to the actual product. The pictures are for reference only. Please understand the inconvenience. .

3.4、真空箱基本参数及安全操作指导 Basic parameters of vacuum box and safe operation guidance

3.4.1、总则 General

本使用说明书随机附送，按照本使用说明书的指导正确地使用机器，有助于保障人机安全，减少维修和停机时间，增强机器的可靠性，延长机器的使用寿命，提高经济效益.机器操作人员必须熟读并理解本说明书内容，本说明必须置于机器附近，以便拿取.操作机器除要遵守本说明书所规定的安全指导外，还必须遵守其它相关专业所规定的安全守则.本机器的设计能保障操作者在遵守本说明书规定的前提下，安全地装卸、使用、维护.在做任何有关机器装卸、清洁、维护、维修工作前，都应先切断电源，以防设备意外起动.任何因违反本说明书的规定而造成的损害，概不在本司质保范围内。我们对机器的改进持保留权，但任何技术上的改进，若未改变机器的功用，则不修改说明书。

This instruction manual is included with the machine. The correct use of the machine in accordance with the instructions of this instruction manual will help ensure the safety of man and machine, reduce maintenance and downtime, enhance the reliability of the machine, extend the service life of the machine, and increase economic benefits. You must read and understand the contents of this manual. This manual must be placed near the machine for easy access. In addition to the safety instructions specified in this manual, the operation of the machine must also comply with the safety rules specified by other related professions. The design can ensure that the operator can safely load and unload, use and maintain under the premise of complying with the provisions of this manual. Before doing any related machine loading and unloading, cleaning, maintenance, and repair work, the power supply should be cut off to prevent the equipment from starting unexpectedly. Any Damages caused by violation of the provisions of this manual are not covered by our warranty. We reserve the right to improve the machine, but if any technical improvement does not change the function of the machine, the manual will not be modified.

本机器只能在定购单上(合同)要求的使用范围内工作，任何超越此范围的使用都是不合规定的，由此而造成的一切后果，由使用者负责，本司概不负责。

This machine can only work within the scope of use required by the purchase order (contract). Any use beyond this scope is not in compliance with the regulations. All consequences caused by this are the responsibility of the user and the company is not responsible.

以下情况不允许操作机器The following conditions are not allowed to operate the machine：

- 机器主随意更换机器零部件；
- 安全装置不全或失效；
- 没有完全阅读并了解本说明书；
- The machine owner can replace the machine parts at will;
- Incomplete or invalid safety devices;
- Did not fully read and understand this manual;

3.4.2、安全 Security

3.4.2.1、设备工作的环境要求 Environmental requirements for equipment work

- 允许环境空气温度：5℃～35℃；
- 贮运温度：-2℃~55℃；
- 相对湿度：至80%，无凝露；
- 污染等级：2级，不应安装在多粉尘，有腐蚀性气体的场所；
- 海拔高度：<1000米，>1000米须降容使用，每升高100米，负载能力降1%。
- 水的纯度：无污染，无石灰质；
- 水　　压：大于0.3 MPa；
- 水　　温：15℃以下；
- Allowed ambient air temperature: 5℃～35℃;
- Storage and transportation temperature: -2℃~55℃;
- Relative humidity: up to 80%, no condensation;
- Pollution level: Level 2, should not be installed in dusty and corrosive gas places;
- Altitude: <1000 meters, >1000 meters must be derated for use, and the load capacity will be reduced by 1% for every 100 meters.
- Purity of water: no pollution, no lime quality;
- Water pressure: greater than 0.3 MPa;
- Water temperature: below 15℃;

3.4.2.2、电源要求 Power requirements

- 供电形式：三相五线制,即TN-S系统（3P/N/PE）
- 三相电压：380V±10%　单相电压：220V±10%
- 电源频率：50Hz
- 进线电缆及断路器要求：要求厂房配备电源柜，厂房配电室电源柜与本设备之间的电缆线由用户提供，总装机容量请查订货合同。
- Power supply form: three-phase five-wire system, namely TN-S system (3P/N/PE)
- Three-phase voltage: 380V±10% Single-phase voltage: 220V±10%
- Power frequency: 50Hz
- Incoming cable and circuit breaker requirements: The factory is required to be equipped with a power cabinet, and the cable between the power cabinet in the power distribution room of the factory and the equipment is provided by the user. Please check the order contract for the total installed capacity.

3.4.2.3、人员要求 Personnel requirements

- 只有经过培训合格的人员才能操作机器，而且必须是由机器主授权。
- 机器的连接，安装，维护，维修工作必须由经过培训的专业人员担当。
- 培训中的人员操作机器，必须在具有丰富经验的员工的监察中进行。
- 机器主明确规定机器操作，维护，维修者所需要具备的能力要求。
- Only trained and qualified personnel can operate the machine, and it must be authorized by the machine owner.
- The connection, installation, maintenance and repair of the machine must be performed by

trained professionals.

- The operation of the machine by the personnel in training must be conducted under the supervision of experienced employees.
- The owner of the machine clearly stipulates the ability requirements for machine operation, maintenance and repairers.

3.4.2.4、机器主的义务 Obligations of the machine owner

- 本操作手册应放在机器附近易拿到的地方。
- 机器主必须遵守一般的正确规定，法律，注意防止事故的产生。
- 应重视本说明书提供的指导，定期检查生产，保持安全意识。
- 在未征得本司同意的情况下，不得对机器及PLC 控制部件作任何改动。
- 按说明书规定的要求对机器进行维护。
- This operation manual should be placed in an easily accessible place near the machine.
- The owner of the machine must abide by the general correct regulations, laws, and pay attention to prevent accidents.
- Pay attention to the guidance provided in this manual, check production regularly, and maintain safety awareness.
- Do not make any changes to the machine and PLC control components without the consent of the company.
- Maintain the machine according to the requirements specified in the manual.

3.4.2.5、防止意外注意事项 Precautions to prevent accidents

- 操作者必须经培训合格，熟悉并理解本说明书提供的内容。
- 按本说明书规定，对机器进行的操作、调整、维护、维修。
- 机器运行前应检查安全装置是否有效。
- 对机器进行调整，维护，维修前必须将开关关闭。
- The operator must be trained and qualified, familiar with and understand the content provided in this manual.
- Operate, adjust, maintain, and repair the machine in accordance with this manual.
- Check whether the safety device is effective before running the machine.
- The switch must be turned off before adjusting, maintaining and repairing the machine.

3.4.2.6、机器操作注意事项 Precautions for machine operation

- 机器开启前应确保无人处于危险区域，对机器进行任何操作都必须事先通知相关同事。
- 机器运转时，严禁攀爬机器。
- 不要留长发，穿松散衣服，或带手饰。
- Before turning on the machine, make sure that no one is in the dangerous area. Any operation on the machine must be notified to relevant colleagues in advance.
- When the machine is running, it is strictly prohibited to climb the machine.
- Don't wear long hair, wear loose clothes, or wear jewelry.

3.4.2.7、机器维护，维修应注意事项 Matters needing attention in machine maintenance

- 在未征得本司的同意下，严禁任何影响机器安全的改动。
- 维护、维修工作请按本说明书所述，关掉机器，将主开关锁死，并在其附近设置警告标志以防意外起动。
- 严禁带电维护，维修电器。
- Any changes that affect the safety of the machine are strictly prohibited without the consent of the company.
- For maintenance and repair work, please turn off the machine as described in this manual, lock the main switch, and set a warning sign near it to prevent accidental starting.

- It is strictly forbidden to maintain and repair electrical appliances when powered on.

3.4.2.8、安全标识的解释说明 Explanation of safety signs

- 为了提醒操作人员在操作过程中避免造成人身伤害，本设备在许多有人身伤害危险的部位张贴了相应的安全警告标志，请在生产和调试，以及保养维护的过程中，不要把这些安全警示标志移位，在拆卸修理机器时，需要移动或者拆下某些标志，请在完成相应的工作之后，将它们安装回原来的位置。
- In order to remind the operator to avoid personal injury during the operation, the equipment has posted corresponding safety warning signs on many parts where personal injury is dangerous. Please do not put these safety warning signs during production, debugging, and maintenance. When disassembling and repairing the machine, some signs need to be moved or removed. Please install them back to their original positions after completing the corresponding work.
- 以免因为地区和国家在安全警示标志意义上的差别，在此特别解释本生产线上的安全警示标志的具体意义，请操作人员在操作机器之前，先了解以下这些安全警示标志的意义。
- In order to avoid differences in the meaning of safety warning signs between regions and countries, here is a special explanation of the specific meaning of the safety warning signs on this production line. Please understand the meaning of the following safety warning signs before operating the machine.

注意！当接通电源后禁止打开任何电线盖、电线管和插头，不然操作者有触电的危险！note! It is forbidden to open any wire covers, conduits and plugs after the power is turned on, otherwise the operator may have the risk of electric shock!

罩中存在高速旋转运动的危险，操作人员除维修外不得拆掉或者换位！
There is a danger of high-speed rotating movement in the cover, the operator shall not remove or change the position except for maintenance!

设备温度较高，操作时请戴防高温手套！The temperature of the equipment is high, please wear high temperature gloves when operating!

3.4.3、运输和安装 Transport and installation

3.4.3.1、整体运输 Overall transportation

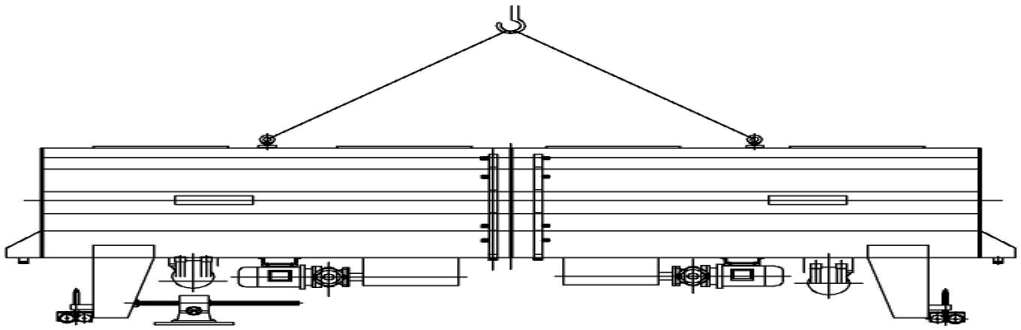
整体运输时，要有适当的支撑和张紧.When transporting as a whole, there must be proper support and tension

3.4.3.2、用叉车运输 Transport by forklift

- 叉车操作员必须是经过培训并取得操作许可证的。
- 注意机器的重心。
- 叉起机器时，所有人员需立即离开危险区。
- Forklift operators must be trained and obtain operating permits.
- Pay attention to the center of gravity of the machine.
- When forklifting the machine, all personnel must leave the danger zone immediately.

3.4.3.3、真空定型箱的吊运 Lifting of vacuum setting box

- 起重操作员必须是经过培训并取得操作许可证的。
- 吊起机器时，所有人员需立即离开危险区域。
- 不能使用已受损的绳索或链条。
- 不能超过绳索或链条所能承受的负荷。
- 由于箱体重量分布不平衡会导致搬运过程中的重心偏移，为防止吊索在吊钩中滑动，套在吊钩中的绳索必须在钩上再多绕一圈。
- Lifting operators must be trained and obtain operating permits.
- When hoisting the machine, all personnel must leave the dangerous area immediately.
- Do not use damaged ropes or chains.
- Do not exceed the load that the rope or chain can bear.
- As the weight distribution of the box body is unbalanced, the center of gravity will be shifted during handling. In order to prevent the sling from sliding in the hook, the rope set in the hook must be wound around the hook one more time.



3.4.3.4、安装 Installation

真空定型箱的就位与安装通常与生产线的其它装置一起进行，安装时必须遵循有关的外形尺寸图和基础图。真空箱的导轨必须安装在非常平整的水泥地坪上，若是地面不平则需将地面垫平，校好水平及中心后采用膨胀螺丝固定。按要求接好进水管、排水管、真空排气管、接水槽淌水管，并将排水管、排气管、淌水管引至地沟，详见下图指示。所有设备以外的水管均由用户自己准备。箱体前后均应留有充足的空间，以便于以后操作及维修方便，具体长度见安装地基图。

The positioning and installation of the vacuum setting box are usually carried out together with other devices of the production line, and the relevant outline and basic drawings must be followed during installation. The guide rail of the vacuum box must be installed on a very flat concrete floor. If the ground is uneven, the ground needs to be leveled, and the level and center should be leveled and fixed with expansion screws. Connect the water inlet pipe, drain pipe, vacuum exhaust pipe, and drain pipe of the water tank as required, and lead the drain pipe, exhaust pipe, and drain pipe to the trench. See the instructions below for details. All water pipes other than the equipment are prepared by the user. Sufficient space should be reserved at the front and rear of the box for easy operation and maintenance in the future. See the installation foundation drawing for the specific length.

补(进)水口
接水源Make up (inlet)

手动进水球阀
Manual inlet ball valve

自动补(进)水气动阀Automatic replenishment

电磁阀The electromagnetic valve

手动排水口
接管路通地沟
Manual drain

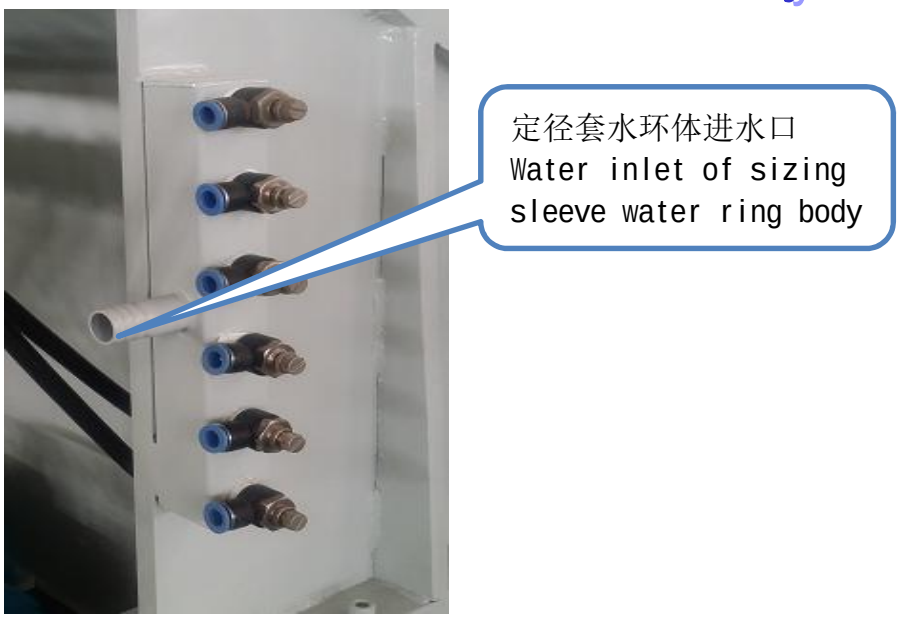
自动排水口
接管路通地沟
Auto drain

水压表Water pressure gauge

水过滤器
water filter

喷淋箱手动进（补）水Manually enter (make up) water in the spray box

喷淋箱手动排水Manual drainage of spray box



3.4.3.5、电气连接 Electrical connections

- 电气方面的工作，需由专业电气人员担当
- 具体连接详见电器原理图（另附）
- 确保电源电压、频率与本机一致（380V，50Hz）
- Electrical work must be undertaken by professional electrical personnel
- For specific connections, please refer to the electrical schematic diagram (attached)
- Ensure that the power supply voltage and frequency are consistent with this machine (380V, 50Hz)

3.4.4、真空箱与喷淋箱的操作说明 Operating instructions for vacuum box and spray box

3.4.4.1、概述 General

真空箱用于生产塑料管材制品。在真空的情况下，冷却定型，保证管材的质量标准。本装置一般分两段，前段为预定型及喷淋，后段进一步冷却定型。

The vacuum box is used to produce plastic pipe products. In the case of vacuum, cooling and shaping to ensure the quality standard of the pipe. This device is generally divided into two sections, the front section is pre-designed and sprayed, and the rear section is further cooled and shaped.

3.4.4.2、结构特点 Structural features

真空箱具有定型效果好，操作简便，使用可靠等优点，深受广大用户信赖。为保证管材的椭圆度，真空定型箱中间支撑管材是使用尼龙托板。真空箱还设有液位控制系统，能自动控制箱内水位高低。有水循环过滤器，可定期清除过滤器中的渣物而不影响生产。有测温自控系统，当水温超过设定温度时，水泵出口角座阀打开将水排出箱体，同时水箱水位降低则自动上水，使循环水温降低至设定温度。

The vacuum box has the advantages of good shaping effect, easy operation and reliable use, and is trusted by the majority of users. In order to ensure the ovality of the pipe, nylon pallets are used for the support pipes in the middle of the vacuum shaping box. The vacuum box is also equipped with a liquid level control system, which can automatically control the water level in the box. There is a water circulation filter, which can periodically remove the residue in the filter without affecting production. There is a temperature measurement automatic control system. When the water temperature exceeds the set temperature, the angle seat valve at the outlet of the water pump opens to drain the water out of the box. At the same

time, when the water level of the water tank decreases, the water is automatically filled to reduce the circulating water temperature to the set temperature.

3.4.4.3、真空箱的技术参数表 Technical parameter table of vacuum box

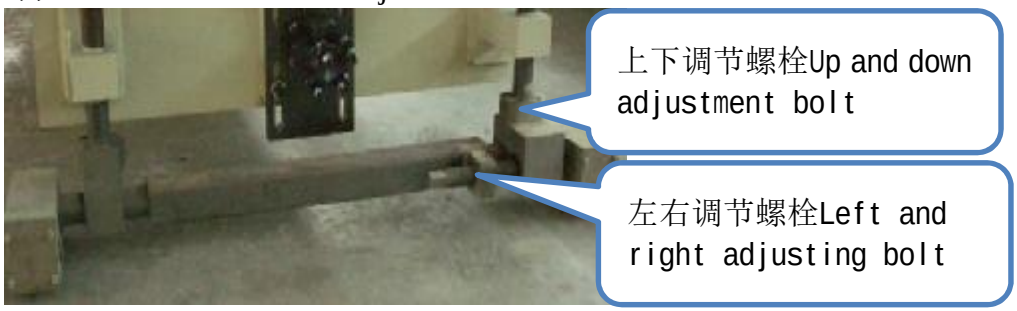
制品范围 Range / 主要配置 Speci	16-75	20-125	50-160	75-315	110-500	280-710
水泵(KW) Water pump	3+4	3+4	3+4	5.5+5.5	5.5+5.5	5.5+7.5*2
真空泵(KW) Vacuum Pump	3+4	3+4	4	4+4	5.5+5.5	4+5.5*2
有效长度(m) Effective length	8.8	8.8	8.8	8.8	8.8	1.5+10.5
前后移动方式 Moving forward and backward	丝杆移动 Screw movement	丝杆移动 Screw movement	丝杆移动 Screw movement	丝杆移动 Screw movement	丝杆移动 Screw movement	丝杆移动 Screw movement
中心高(mm)	1000	1000	1000	1000	1150	1300

3.4.4.4、喷淋箱的技术参数表 Technical parameter table of spray box

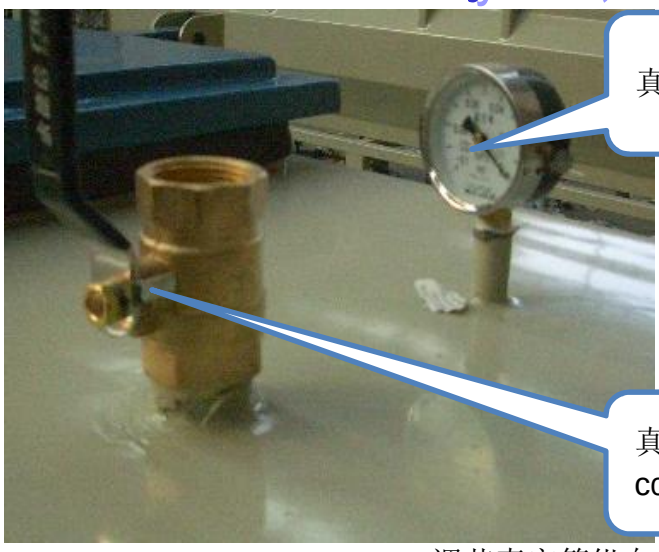
制品范围 Range / 主要配置 Spec	16-75	20-125	50-160	75-315	110-500	280-710
水泵(KW) Water Pump	无	4	4	5.5	7.5	7.5
有效长度(mm) Effective length	8.8	8.8	8.8	8.8	8.8	1.5+10.5
中心高(mm) Center height	1000	1000	1000	1000	1150	1300

3.4.4.5、零部件功能 Parts function

- 垂直与横向调节机构Vertical and horizontal adjustment mechanism

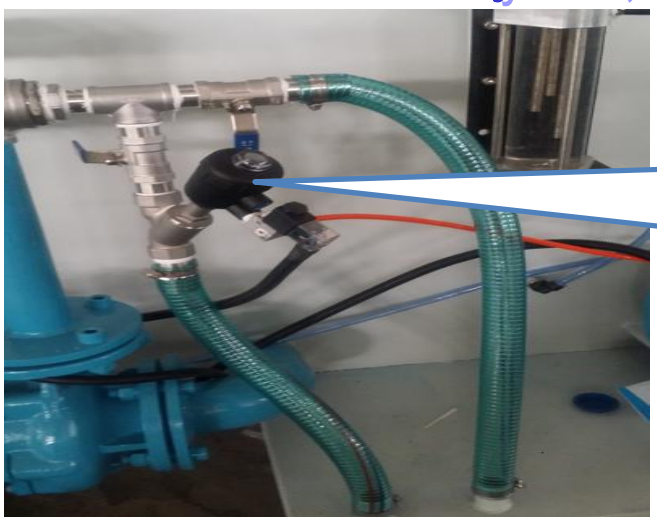


- 真空表Vacuum meter：反映定径箱内实际真空度　Reflect the actual vacuum degree in the sizing box
- 真空阀Vacuum valve：调节真空箱内真空度Adjust the vacuum degree in the vacuum box。

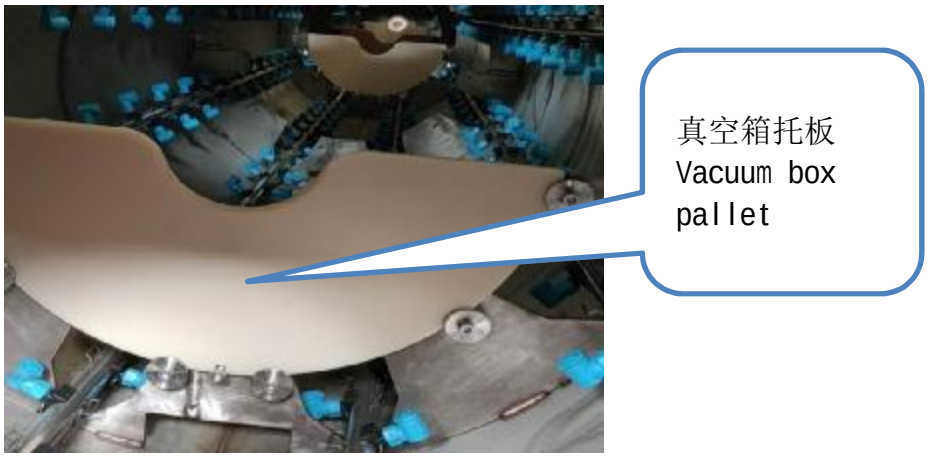


- 纵向移动机构Longitudinal movement mechanism：调节真空箱纵向位置（与口模的相对位置） Adjust the longitudinal position of the vacuum box (relative to the mold)

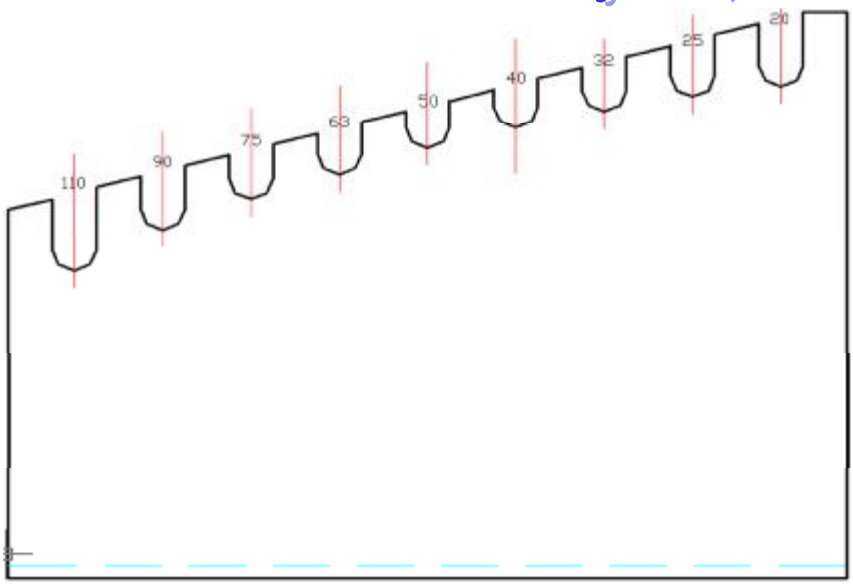
- 排水气动阀Drain pneumatic valve
  - 当真空箱内水温超过设定温度时，气动阀打开，部分水被排除，水箱自动上水，水温降低 When the water temperature in the vacuum box exceeds the set temperature, the pneumatic valve opens, part of the water is drained, the water tank is automatically filled with water, and the water temperature is reduced
  - 当真空箱内水位超过设定水位时，气动阀打开，部分水被排除，水箱自动上水When the water level in the vacuum box exceeds the set water level, the pneumatic valve opens, part of the water is drained, and the water tank is automatically filled with water



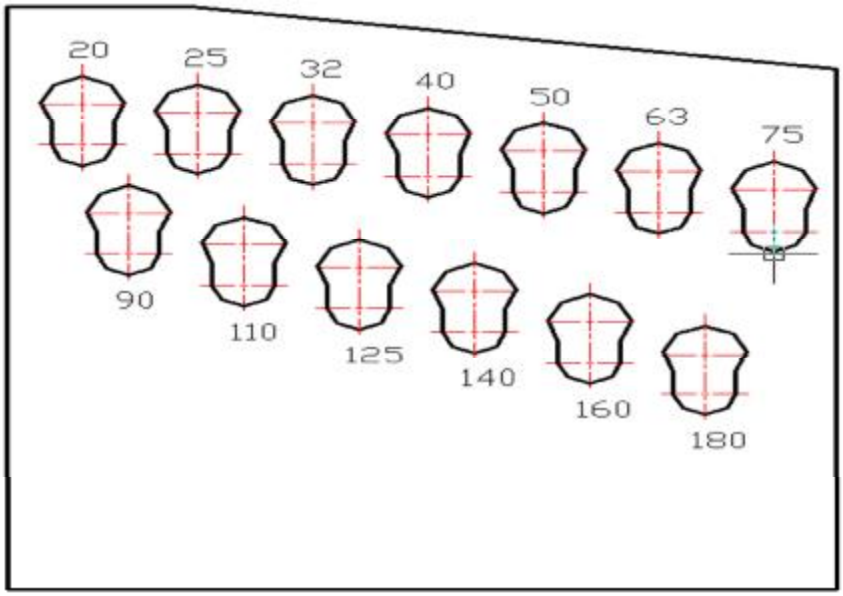
- 托辊装置Roller device: 喷淋箱箱体中的托辊位置要根据所生产制品规格的改变而更换位置，真空箱内为托板。The position of the roller in the spray box body should be changed according to the changes in the product specifications. The vacuum box is a pallet.



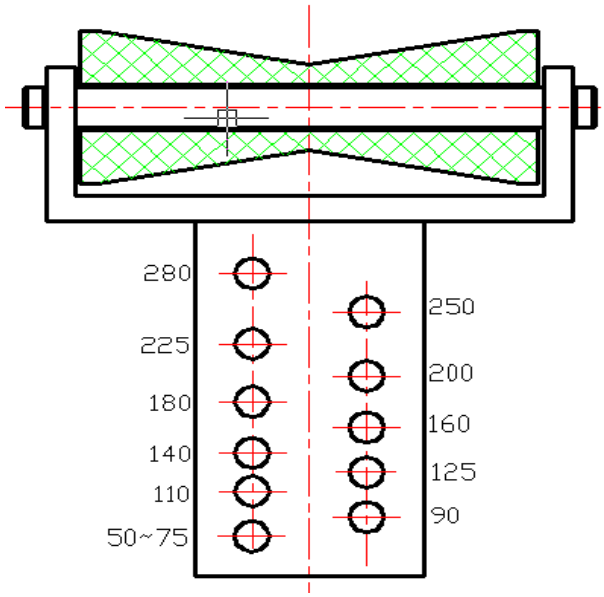
- Φ16~Φ75喷淋箱体中托辊位置　　Φ16~Φ75 roller position in the spray box



Ø Φ20~Φ125喷淋箱体中托辊位置Position of roller in Φ20~Φ125 spray box

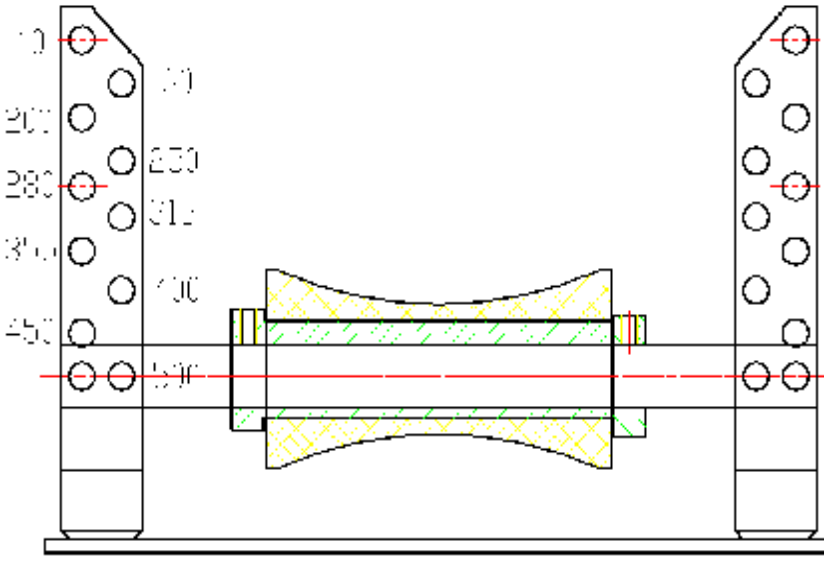


Ø Φ50~Φ160喷淋箱体中托辊位置 Φ50~Φ160 roller position in the spray box

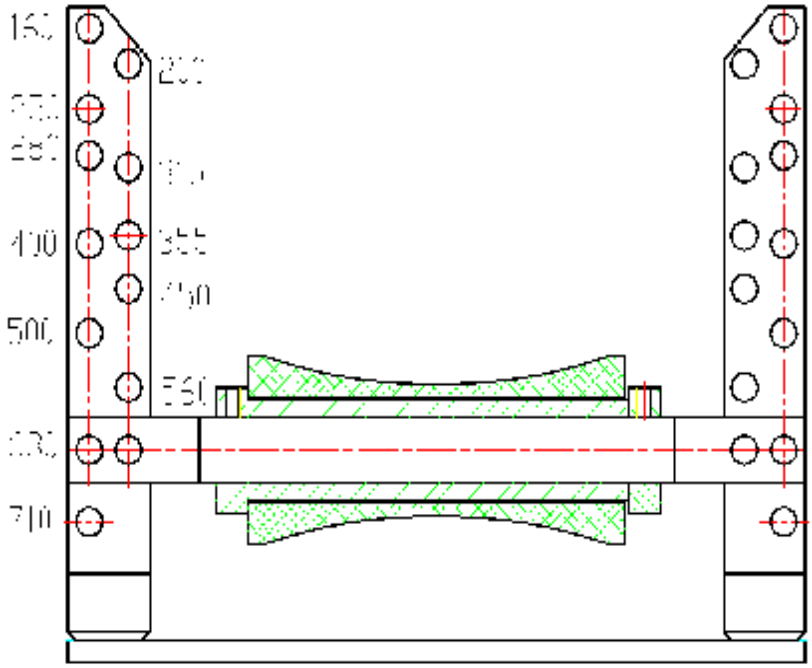


Ø Φ75~Φ315喷淋箱体中托辊位置　　Φ75~Φ315 roller position in spray box

Ø Φ110～Φ450喷淋箱体中托辊位置　Φ110～ Φ450 The position of the roller in the spray box



Ø Φ250～Φ710喷淋箱体中托辊位置Position of roller in　Φ250～ Φ710 spray box



3.4.4.6、机器的调试 Machine debugging

- 打开进水阀真空箱内注水至所需要的位置（从液位筒上可以观察）
- 按照规格调整好箱体中托辊的位置.
- 检查气路有无漏气现象. 启动真空箱，喷淋箱水泵，观察有无漏水现象；水压是否正常，箱体里水柱有无喷成雾状；各电机动作是否正常；检查水位以及自动补水，排水系统是否正常.
- 启动水泵调整好喷嘴的喷淋方向，使喷嘴的喷淋方向对准制品. 调节方法：拧松喷淋管上的卡箍，转动喷淋管至需要的位置，然后拧紧卡箍（水泵的使用、维护、保养请查看水泵说明书）
- 启动真空泵，打开真空调节阀，按真空泵使用说明书调节进水量（真空泵的使用、维护、保养请查看真空泵说明书）
- 调节真空箱的中心高与横向位置，使真空箱的中心高对准挤出机的中心，调节方法如下：
  - 升降调节：调节滚轮上的调节螺母使箱体上下移动
  - 横向调节：调节滚轮支撑架上的调节螺栓使箱体横向移动
  - 纵向移动：在按钮面板上，启动纵进、纵退可使箱体纵向移动
  - Open the water inlet valve and pour water into the vacuum box to the required position (observable from the liquid level cylinder)
  - Adjust the position of the roller in the box according to the specifications.
  - Check the air path for air leakage. Start the vacuum box and spray box water pump to observe whether there is water leakage; whether the water pressure is normal, whether the water column in the box is sprayed into mist; whether the motors are operating normally; check the water level and Automatic water replenishment, whether the drainage system is normal.
  - Start the water pump and adjust the spray direction of the nozzle so that the spray direction of the nozzle is aligned with the product. Adjustment method: loosen the clamp on the spray pipe, turn the spray pipe to the required position, and then tighten the clamp (the water pump Please check the pump manual for use, maintenance and maintenance)
  - Start the vacuum pump, open the vacuum regulating valve, and adjust the water intake

according to the vacuum pump instruction manual (please refer to the vacuum pump manual for the use, maintenance and maintenance of the vacuum pump)

- Ø Adjust the center height and lateral position of the vacuum box so that the center height of the vacuum box is aligned with the center of the extruder. The adjustment method is as follows:
- Ø Lift adjustment: adjust the adjusting nut on the roller to move the box up and down
- Ø Horizontal adjustment: adjust the adjusting bolt on the roller support frame to move the box laterally
- Ø Longitudinal movement: On the button panel, start longitudinal forward and backward to move the cabinet longitudinally

3.4.4.7、开机 Boot up

- 根据制品管材规格的不同，更换真空箱的托板，调整好喷淋箱的托辊高度，并观察喷淋嘴的位置。更换对应的定径套以及真空箱和喷淋箱的密封板
- 打开定径套冷却水，根据定径套结构不同，事先可适当调节好定径套冷却水
- 当管材进入定径套的同时启动真空箱水泵和真空泵
- According to different product pipe specifications, replace the pallet of the vacuum box, adjust the height of the roller of the spray box, and observe the position of the spray nozzle. Replace the corresponding sizing sleeve and the sealing plate of the vacuum box and spray box
- Open the cooling water of the sizing sleeve. According to the different structure of the sizing sleeve, the cooling water of the sizing sleeve can be properly adjusted in advance
- When the pipe enters the sizing sleeve, start the vacuum box water pump and vacuum pump at the same time

3.4.4.8、停机 Stop

- 先切断口模处管材，使管材处于真空箱体内（断口不进入真空箱体内），保压足够长的时间，使管材断口冷却定型（保证管材断口的圆度，防止变形断口刮伤箱体内部结构，牵引机能够顺利拉出管材），然后停止真空箱水泵和真空泵，喷淋箱水泵
- 真空箱后退，并关闭水、电、气，打扫现场卫生
- Cut the pipe at the mold first, so that the pipe is in the vacuum box (the fracture does not enter the vacuum box), and hold the pressure for a long enough time to cool and shape the pipe fracture (to ensure the roundness of the pipe fracture to prevent the deformed fracture from scratching the box Internal structure, the tractor can pull out the pipe smoothly), then stop the vacuum box water pump and vacuum pump, spray box water pump
- Retreat the vacuum box and turn off the water, electricity, and gas to clean the site

3.4.5、保养和维修 Maintenance and repair

3.4.5.1、注意事项 Precautions

- 维护或维修前应关掉主开关，并将其锁死，以防意外启动
- 准备好适当的工具
- 真空泵启动时必须将进水口打开
- 维护或维修前应拭去机器上的油污或尘土、特别注意电源输出或连接处
- 长期不使用时，必须将水箱中的水彻底排空
- Turn off the main switch before maintenance or repair, and lock it to prevent accidental startup
- Prepare the appropriate tools
- The water inlet must be opened when the vacuum pump is started
- Before maintenance or repair, wipe off the oil or dust on the machine, pay special attention to the power output or connection

- When not in use for a long time, the water in the water tank must be completely drained

3.4.5.2、每日维护 Daily maintenance

- 清洁机器
- 每日必须检查各管道安装是否漏气、漏水，各紧固件是否松动
- 每日观察水泵出水压力，过低就要拆洗过滤器
- 观察窗有机玻璃必须保持清洁
- 电器，电动元器件不允许有水溅上
- 纵向调节丝杆，升降调节丝杆调好后必须涂上防锈脂，并包好
- Clean the machine
- Daily check whether each pipeline installation is leaking air or water, and whether each fastener is loose
- Observe the outlet pressure of the water pump daily, if it is too low, remove and wash the filter
- Observation window plexiglass must be kept clean
- Water splashing on electrical appliances and electric components is not allowed
- Longitudinal adjustment screw rod, after adjustment, the lifting adjustment screw rod must be coated with anti-rust grease and wrapped

3.5、牵引机基本参数及安全操作指导 Basic parameters and safe operation guidance of tractor

3.5.1、总则 General

本使用说明书随机附送，按照本使用说明书的指导正确地使用机器，有助于保障人机安全，减少维修和停机时间，增强机器的可靠性，延长机器的使用寿命，提高经济效益。

机器操作人员必须熟读并理解本说明书内容，本说明必须置于机器附近，以便拿取。

操作机器除要遵守本说明书所规定的安全指导外，还必须遵守其它相关专业所规定的安全守则。

本机器的设计能保障操作者在遵守本说明书规定的前提下，安全地装卸、使用、维护。在做任何有关机器装卸、清洁、维护、维修工作前，都应先切断电源，以防意外起动。任何因违反本说明书的规定而造成的损害，概不在本保证范围内。

我们对机器的改进持保留权，但任何技术上的改进，若未改变机器的功用，则不修改说明书。

本机器只能在定购单上(合同)要求的使用范围内工作，任何超越此范围的使用都是不合规定的，由此而造成的一切后果，由使用者负责，制造商概不负责。

This instruction manual is included with the machine. The correct use of the machine in accordance with the instructions of this instruction manual will help ensure the safety of man and machine, reduce maintenance and downtime, enhance the reliability of the machine, extend the service life of the machine, and increase economic benefits.

The machine operator must read and understand the contents of this manual, which must be placed near the machine for easy access.

In addition to the safety instructions stipulated in this manual, the operation of the machine must also comply with the safety rules stipulated by other relevant professions.

The design of this machine can ensure that the operator can safely load and unload, use and maintain under the premise of complying with the provisions of this manual. Before doing any work related to machine loading, unloading, cleaning, maintenance, and repair, the power supply should be cut off to prevent accidental starting. Any damage caused by violation of the provisions of this manual is not within the scope of this warranty.

We reserve the right to improve the machine, but if any technical improvement does not change the function of the machine, the manual will not be modified.

This machine can only work within the scope of use required by the purchase order (contract). Any use beyond this scope is not in compliance with the regulations. All consequences caused by this are the responsibility of the user and the manufacturer is not responsible.

以下情况不允许操作机器The following conditions are not allowed to operate the machine：

- 机器主随意更换机器零部件
- 安全装置不全或失效
- 没有完全阅读并了解本说明书
- The machine owner can replace the machine parts at will
- Incomplete or invalid safety devices
- I did not fully read and understand this manual

3.5.2、安全 Security

3.5.2.1、设备工作的环境要求 Environmental requirements for equipment work

- 允许环境空气温度：+5℃～35℃；
- 贮运温度：-20℃~55℃；
- 相对湿度：至80%，无凝露；
- 污染等级：2级，不应安装在多粉尘，有腐蚀性气体的场所；
- 海拔高度：<1000米，>1000米须降容使用，每升高100米，负载能力降1%
- Allowed ambient air temperature: +5℃～35℃;
- Storage and transportation temperature: -20℃~55℃;
- Relative humidity: up to 80%, no condensation;
- Pollution level: Level 2, should not be installed in dusty and corrosive gas places;
- Altitude: <1000m, >1000m must be derated for use, and the load capacity is reduced by 1% for every 100m increase

3.5.2.2、电源要求 Power requirements

- 供电形式：三相五线制，即TN-S系统（3P/N/PE）
- 三相电压：380V±10%　单相电压：220V±10%
- 电源频率：50Hz
- 进线电缆及断路器要求：要求厂房配备电源柜，厂房配电室电源柜与本设备之间的电缆线由用户提供，总装机容量请查订货合同。
- Power supply form: three-phase five-wire system, namely TN-S system (3P/N/PE)
- Three-phase voltage: 380V±10% Single-phase voltage: 220V±10%
- Power frequency: 50Hz
- Incoming cable and circuit breaker requirements: The factory is required to be equipped with a power cabinet, and the cable between the power cabinet in the power distribution room of the factory and the equipment is provided by the user. Please check the order contract for the total installed capacity.

3.5.2.3、人员要求 Personnel requirements

- 只有经过培训合格的人员才能操作机器，而且必须是由机器主授权。
- 机器的连接，安装，维护，维修工作必须由经过培训的专业人员担当。
- 培训中的人员操作机器，必须在具有丰富经验的员工的监察中进行。
- 机器主明确规定机器操作，维护，维修者所需要具备的能力要求。
- Only trained and qualified personnel can operate the machine, and it must be authorized by

the machine owner.

- The connection, installation, maintenance and repair of the machine must be performed by trained professionals.
- The operation of the machine by the personnel in training must be conducted under the supervision of experienced employees.
- The owner of the machine clearly stipulates the ability requirements for machine operation, maintenance and repairers.

3.5.2.4、机器主的义务 Obligations of the machine owner

- 本操作手册应放在机器附近易拿到的地方。
- 机器主必须遵守一般的正确规定，法律，注意防止事故的产生。
- 应重视本说明书提供的指导，定期检查生产，保持安全意识。
- 在未征得制造厂家同意的情况下，不得对机器及PLC控制部件作任何改动。
- 按说明书规定的要求对机器进行维护。
- This operation manual should be placed in an easily accessible place near the machine.
- The owner of the machine must abide by the general correct regulations, laws, and pay attention to prevent accidents.
- Pay attention to the guidance provided in this manual, check production regularly, and maintain safety awareness.
- Do not make any changes to the machine and PLC control components without the consent of the manufacturer.
- Maintain the machine according to the requirements specified in the manual.

3.5.2.5、意外防止注意事项 Precautions for accident prevention

- 操作者必须经培训合格，熟悉并理解本说明书提供的内容。
- 按本说明书规定，对机器进行的操作、调整、维护、维修。
- 机器运行前应检查安全装置是否有效。
- 对机器进行调整，维护，维修前必须将开关关闭。
- The operator must be trained and qualified, familiar with and understand the content provided in this manual.
- Operate, adjust, maintain, and repair the machine in accordance with this manual.
- Check whether the safety device is effective before running the machine.
- The switch must be turned off before adjusting and maintaining the machine.

3.5.2.6、机器操作注意事项 Precautions for machine operation

- 机器开启前应确保无人处于危险区域，对机器进行任何操作都必须事先通知相关同事；
- 机器运转时，严禁攀爬机器；
- 不要留长发，穿松散衣服，或带手饰。
- Before turning on the machine, make sure that no one is in the dangerous area. Any operation on the machine must be notified to relevant colleagues in advance;
- It is strictly forbidden to climb the machine when the machine is running;
- Do not wear long hair, wear loose clothes, or wear jewelry.

3.5.2.7、机器维护，维修应注意事项 Matters needing attention in machine maintenance

- 在未征得供应商的同意下，严禁任何影响机器安全的改动。
- 维护、维修工作请按本说明书所述，关掉机器，将主开关锁死，并在其附近设一警告标志以防意外起动。
- 严禁带电维护，维修电器。
- Any changes that affect the safety of the machine are strictly prohibited without the supplier's consent.

- For maintenance and repair work, please turn off the machine as described in this manual, lock the main switch, and set a warning sign near it to prevent accidental starting.
- Maintenance and repair of electrical appliances are strictly prohibited.

3.5.2.8、安全标识的解释说明 Explanation of safety signs

- 为了提醒操作人员在操作过程中避免造成人身伤害，本设备在许多有人身伤害危险的部位张贴了相应的安全警告标志，请在生产和调试，以及保养维护的过程中，不要把这些安全警示标志移位，在拆卸修理机器时，需要移动或者拆下某些标志，请在完成相应的工作之后，将它们安装回原来的位置。
- 以免因为地区和国家在安全警示标志意义上的差别，在此特别解释本生产线上的安全警示标志的具体意义，请操作人员在操作机器之前，先了解以下这些安全警示标志的意义。
- In order to remind the operator to avoid personal injury during operation, the equipment has posted corresponding safety warning signs on many parts where personal injury is dangerous. Please do not use these safety warnings during production, debugging, and maintenance. The signs are shifted. When disassembling and repairing the machine, some signs need to be moved or removed. Please install them back to their original positions after completing the corresponding work.
- In order to avoid differences in the meaning of safety warning signs between regions and countries, here is a special explanation of the specific meaning of the safety warning signs on this production line. Please understand the meaning of the following safety warning signs before operating the machine.

注意！当接通电源后禁止打开任何电线盖、电线管和插头，不然操作者有触电的危险！note! It is forbidden to open any wire covers, conduits and plugs after the power is turned on, otherwise the operator may have the risk of electric shock!

罩中存在高速旋转运动的危险，操作人员除维修外不得拆掉或者换位！There is a danger of high-speed rotating movement in the cover, the operator shall not remove or change the position except for maintenance!

3.5.3、运输和安装 Transport and installation

3.5.3.1、整体运输 Overall transportation

整体运输时，要有适当的支撑和张紧During overall transportation, proper support and tension should be provided

3.5.3.2、用叉车运输 Transport by forklift

- 叉车操作员必须是经过培训并取得操作许可证的；
- 注意机器的重心；
- 叉起机器时，所有人员需立即离开危险区
- Forklift operators must be trained and obtain operating permits;
- Pay attention to the center of gravity of the machine;
- All personnel must leave the danger zone immediately when lifting the machine

3.5.3.3、安装 installation

牵引机的就位与安装通常与生产线的其它装置一起进行，安装时必须遵循有关的外形尺寸图和基础图，牵引机与水泥地面采用地脚膨胀螺栓固定。

The positioning and installation of the tractor are usually carried out together with other devices of the production line. The relevant outline and basic drawings must be followed during installation. The tractor and the concrete floor are fixed by anchor expansion bolts.

3.5.3.4、牵引机的吊运 Lifting of tractor

- 起重操作员必须是经过培训并取得操作许可证的；
- 吊起机器时，所有人员需立即离开危险区域；
- 不能使用已受损的绳索或链条；
- 不能超过绳索或链条所能承受的负荷；
- Lifting operators must be trained and obtained operating permits;
- When hoisting the machine, all personnel must leave the dangerous area immediately;
- Do not use damaged ropes or chains;
- Can not exceed the load that the rope or chain can bear;

3.5.3.5、场地条件 Site conditions

牵引机必须安装在非常平整的水泥地坪上，若是地面不平则需将地面垫平，采用水平仪检验切割机的水平度（前后左右不得大于0.3mm）；牵引机的中心要与挤出模具的中心同心，同心度不得大于0.5mm。校好水平及中心后采用膨胀螺丝固定。牵引机前后均应留有充足的空间，以便于以后操作及维修方便，具体长度见安装地基图。

The tractor must be installed on a very flat cement floor. If the ground is uneven, the ground needs to be leveled. Use a level to check the level of the cutting machine (the front, rear, left, and right should not be greater than 0.3mm); the center of the tractor must be in line with the extrusion mold The center is concentric, and the concentricity should not be greater than 0.5mm. Use expansion screws to fix the level and the center. Sufficient space should be reserved at the front and rear of the tractor for easy operation and maintenance in the future. See the installation foundation drawing for the specific length.

3.5.3.6、电气连接 Electrical connections

- 电气方面的工作，需由专业电气人员担当
- 具体连接详见电器原理图（另附）
- 确保电源电压、频率与本机一致（380V，50Hz）
- Electrical work must be undertaken by professional electrical personnel
- For specific connections, please refer to the electrical schematic diagram (attached)
- Ensure that the power supply voltage and frequency are consistent with the machine (380V, 50Hz)

3.5.4、牵引机操作说明 Traction machine operating instructions

3.5.4.1、概述 General

我司生产的牵引机，用于管材的匀速牵引，在牵引过程中牵引臂同步旋转，并保持

与管材速度的一致。履带牵引机的牵引臂，呈对称分布，在生产不同规格的管材时，下面两支牵引臂通过电动丝杠进行相应的调节，将管材高度刚好保持在生产线的中心位置，调节好后再进行气缸夹紧。牵引装置的旋转由电机通过链轮和链条传动，每一牵引臂上有一链轮，和独立的电机，旋转时保持各牵引臂的同步性。牵引臂上装有耐磨性良好的橡胶，保证在牵引时既不破坏管材表面又可以增加牵引时的摩擦力，防止在牵引过程中出现打滑现象。

The tractor produced by our company is used for the uniform traction of the pipe. The traction arm rotates synchronously during the traction process and keeps the same speed as the pipe. The traction arms of the crawler tractor are symmetrically distributed. When producing pipes of different specifications, the lower two traction arms are adjusted accordingly through the electric screw to keep the height of the pipe just at the center of the production line. After adjustment, perform the cylinder Clamping. The rotation of the traction device is driven by a motor through a sprocket and a chain. Each traction arm has a sprocket and an independent motor to maintain the synchronization of the traction arms when rotating. The towing arm is equipped with rubber with good wear resistance to ensure that it will not damage the surface of the pipe when towing, but also increase the friction during traction, and prevent slipping during the traction process.

3.5.4.2、牵引机的技术参数表 Technical parameter table of tractor

型号 Model / 主要配置 Spec	GFQY110	GFQY250	GFQY315	GFQY400	GFQY500	GFQY630
牵引规格Traction specifications	125	250	315	400	500	630
牵引速度Traction speed	1-10	0.35-3.5	0.35-3.5	0.35-3.5	0.2-2	0.1-1
电机功率(交流)Motor power (AC)	1.5*2	1.5*3	1.5*4	1.5*4	1.5*6	0.55*6
电机功率(伺服)Motor power (servo)	1.8*2	1.8*3	1.8*4	1.8*4	0.85*6	0.85*6
牵引臂数量 Number of towing arms	2	3	4	4	6	6
中心高mm Center height mm	1000	1000	1000	1150	1150	1300
有效长度mm Effective length mm	1400	1800	1800	1800	2200	2000
外形尺寸 Dimensions	2450*850*1690	3070*1575*1780	3070*1575*1780	3090*1730*1970	3628*2180*2170	3422*2200*2390

3.5.4.3、牵引机的调试 Debugging of tractor

3.5.4.3.1、牵引装置 Traction device

在牵引机的每个牵引臂上都安装有一台交流电机或者伺服电机，电机通过减速机相连，减速机输出轴上安装有一链轮，链轮带动链条匀速转动，可以调整电机的转速来调

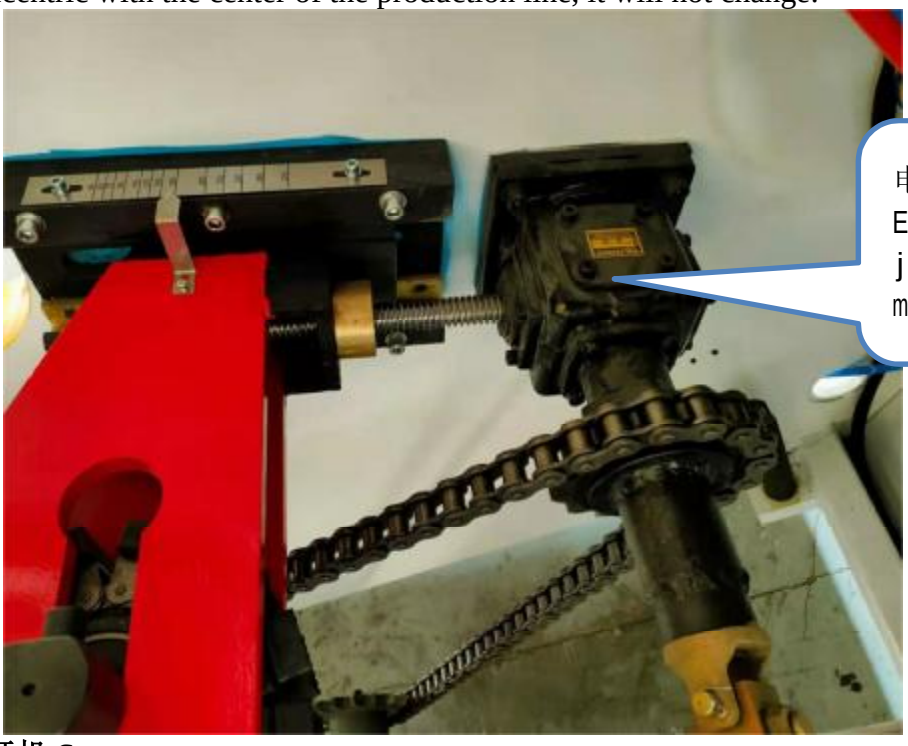
整链条的线速度。

An AC motor or servo motor is installed on each traction arm of the tractor. The motor is connected by a reducer. A sprocket is installed on the output shaft of the reducer. The sprocket drives the chain to rotate at a uniform speed. The motor speed can be adjusted to adjust the chain. Line speed.

3.5.4.3.2、夹紧装置 Clamping device

牵引夹紧时上部的牵引臂通过汽缸进行夹紧，更换管材规格时,无须调节,上下气缸合拢时就自然对中。每一个气动压紧的牵引臂的夹紧力都可以调节，这是通过控制面板上相对应的调压阀进行的调节的，顺时针增压反之减压。在保证管材不打滑的情况下调至最低压力值，以免管材变形。下部的两个牵引臂通过电机带动顶升丝杠调节，更换管材规格时，靠顶升丝杠的上升和下降实现对中，一旦调到管材中心与生产线的中心同心后不再变动。

When traction and clamping, the upper traction arm is clamped by the cylinder. When changing the pipe specifications, there is no need to adjust. The upper and lower cylinders are naturally centered when they are closed. The clamping force of each pneumatically compressed traction arm can be adjusted, which is adjusted by the corresponding pressure regulating valve on the control panel, clockwise pressurizes and vice versa. Adjust to the lowest pressure value while ensuring that the pipe does not slip to avoid deformation of the pipe. The two lower traction arms are adjusted by the motor to drive the jacking screw. When changing pipe specifications, the jacking screw is raised and lowered to achieve centering. Once the pipe center is concentric with the center of the production line, it will not change.



3.5.4.3.3、开机 Start up

- 首先启动牵引机，给定转速，看牵引正转，反转是否正常。
- 启动牵引压紧放松观察其动作是否正常。将开关打开，并将气源打开，调节牵引机速度与挤出机的挤出速度一致，然后调节牵引机上两减压阀，保证合适的夹紧力，夹紧力不宜过大，否则将制品夹变形即完成牵引工作。
- 选择牵引管。可选和生产制品管材规格相同的牵引管，但建议选择生产制品管材规格小一型号的牵引管。利用牵引反转把牵引管牵引到指定位置，同时调节好牵引臂在管

材上的适当位置

- 具体开机操作请参考主机说明书。（牵引机操作说明）
- First start the tractor, set the speed, and see if the tractor is running forward and reverse.
- Start the traction, press and relax to observe whether the movement is normal. Turn on the switch and the air source, adjust the tractor speed to be consistent with the extrusion speed of the extruder, and then adjust the two pressure relief valves on the tractor to ensure proper clamping force. The clamping force should not be too large, otherwise the product The deformation of the clamp completes the traction work.
- Select the traction tube. The traction tube with the same specifications as the pipe of the production product can be selected, but it is recommended to choose the traction tube with the smaller specification of the pipe of the production product. Use the traction reversal to pull the traction tube to the designated position, and at the same time adjust the proper position of the traction arm on the tube
- For specific boot operations, please refer to the Extruder manual. (Operation instructions for tractor)

3.5.4.3.4、牵引速度 Traction speed

牵引速度的调节靠变频器或伺服驱动器来实现，可以在主机屏幕设置所需的速度，也可以在真空箱操作盒上对牵引速度进行调节，在生产过程中，观察模具口出料情况和所要求管材壁厚进行速度调节。

The adjustment of the traction speed is realized by the frequency converter or the servo drive. The required speed can be set on the screen of the Extruder, or the traction speed can be adjusted on the vacuum box operation box. During the production process, observe the mold outlet and the position The pipe wall thickness is required for speed adjustment.

保养和维修Maintenance and repair

3.5.5、维护 maintain

3.5.5.1、注意事项 Precautions

- 维护或维修前应关掉主开关，并将其锁死，以防意外启动。
- 准备好适当的工具。
- 维护或维修前应拭去机器上的油污或尘土、特别注意电源输出或连接处。
- Turn off the main switch before maintenance or repair, and lock it to prevent accidental startup.
- Prepare proper tools.
- Before maintenance or repair, wipe off the oil or dust on the machine, paying special attention to the power output or connection.

3.5.5.2、每日维护 Daily maintenance

每天清除气动三联件内分离出的水，如不及时清理将有水进入气缸和阀。会使其内部生锈而造成频繁故障。油雾器不能断油，保证气动元件内的润滑，同样是为了减少故障。

Clean the water separated from the pneumatic triplex every day. If it is not cleaned in time, water will enter the cylinder and valve. It will rust inside and cause frequent failures. The lubricator can not cut off the oil to ensure the lubrication in the pneumatic components, which is also to reduce failures.

3.5.5.3、每月维修 Monthly maintenance

- 清洁机器。
- 检查电器开关、按钮、插头是否定好，如有损伤，立即维修。
- 检查牵引臂上履带的张紧情况，若太松则需张紧。
- Clean the machine.

- Check whether the electrical switches, buttons, and plugs are in good order, and repair them immediately if they are damaged.
- Check the tension of the crawler belt on the towing arm, if it is too loose, it needs to be tensioned.

- 清理气动三联件上的过滤器，并换上新油。

- 传动链条加2L-2#锂基脂润滑脂。
- 下顶升丝杠上加润滑脂。
- Clean the filter on the pneumatic triplex and replace with new oil.
- Add 2L-2# lithium base grease to the transmission chain.
- Add grease to the lower jacking screw.

3.5.6、Y 系列低压交流电动机 Y series low voltage AC motor

3.5.6.1、电机的运转 Motor operation

- 电动机一般应装有过热保护、短路保护、断相保护和零序多道保护装置，可防止单道保护失灵。根据电动机铭牌上额定电流值调整保护装置的额定值，额定值不应超过电机铭牌额定值。电机不宜连续多次起动。以防频繁起动，而引起电机过热，以至烧毁。
- 电源的频率(电压为额定)与额定值偏差超过1%或电压{频率为额定)与额定值的偏差超过5%时，电动机不能保证连续输出额定功率。连续运行的电动机不允许过载。
- 电动机空载或负载运行时，不应有断续的或异常的声响或振动。轴承温度不应超过95℃。
- The motor should generally be equipped with overheating protection, short-circuit protection, phase-failure protection and zero-sequence multi-channel protection devices to prevent failure of single-channel protection. Adjust the rated value of the protection device according to the rated current value on the motor nameplate, and the rated value should not

exceed the motor nameplate rating. The motor should not be started multiple times in succession. To prevent frequent starting, causing the motor to overheat and even burn out.

- When the frequency (voltage is rated) and the rated value deviate by more than 1% or the voltage (frequency is rated) deviates more than 5% from the rated value, the motor cannot guarantee continuous output rated power. Motors running continuously are not allowed to be overloaded.
- There should be no intermittent or abnormal sound or vibration when the motor is running with no load or load. The bearing temperature should not exceed 95°C.

3.5.6.2、电机的维护和存放 Motor maintenance and storage

- 电动机使用环境应保持干燥清洁和良好的通风。电动机通风口不应被尘土纤维阻塞。不然会导致通道阻塞以致降低冷却进风量。
- 当电动机的热保护装置及短路装置连续发生动作时，应查明故障来源。是电动机的保护装置导致，还是超负荷引起。消除故障后方可投入运行。
- 应保证电动机轴承在运行期间有良好的润滑。二极电动机运行超过2000h，4、6、8、10极电机运行超过4000h时，应补充或更换3号锂基润滑脂。密封轴承在寿命期内不必更换润滑脂。在电机运行中若发现轴承过热或润滑脂变质时，应及时更换润滑脂。填入的润滑脂占轴承室的2／3。
- The environment of the motor should be kept dry, clean and well ventilated. Motor vents should not be blocked by dust fibers. Otherwise, the passage will be blocked and the cooling air intake will be reduced.
- When the thermal protection device and short-circuit device of the motor continuously act, the source of the fault should be found. Is it caused by the protection device of the motor or caused by overload. It can be put into operation after the fault is eliminated.
- Ensure that the motor bearings are well lubricated during operation. When the two-pole motor runs for more than 2000 hours, and the 4, 6, 8, and 10-pole motors run for more than 4000 hours, the No. 3 lithium grease should be supplemented or replaced. Sealed bearings do not need to be replaced with grease during their life. If the bearing is overheated or the grease is deteriorated during the operation of the motor, the grease should be replaced in time. The filled grease accounts for 2/3 of the bearing chamber.

3.5.7、伺服电机 Servo motor

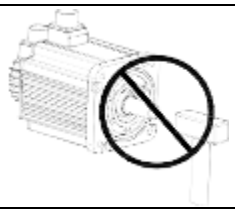
3.5.7.1、安装场所 Installation site

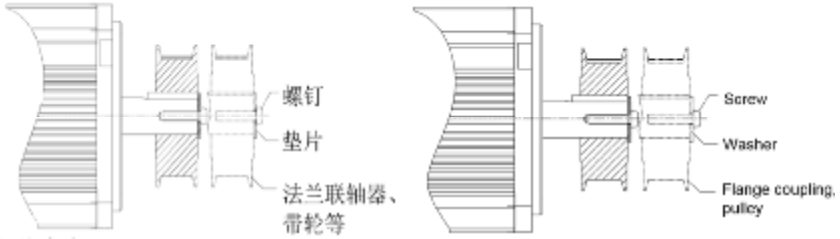
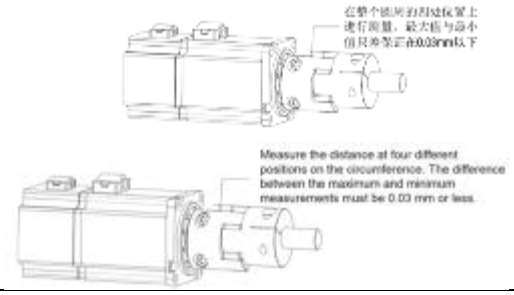
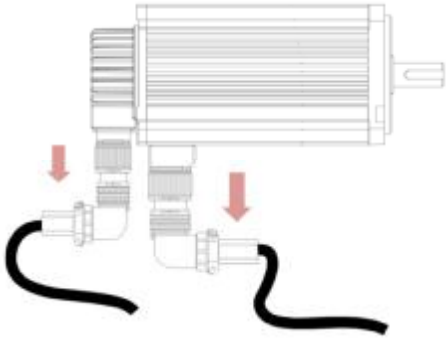
- 请勿在有硫化氢、氯气、氨、硫磺、氯化性气体、酸、碱、盐等腐蚀性及易燃性气体环境、可燃物等附近使用本产品；
- 在有磨削液、油雾、铁粉、切削等的场所请选择带油封机型；
- 远离火炉等热源的场所；
- 请勿在封闭环境中使用电机。封闭环境会导致电机高温，缩短使用寿命。
- Do not use this product near corrosive and flammable gas environments such as hydrogen sulfide, chlorine, ammonia, sulfur, chlorinated gas, acid, alkali, salt, etc., or combustible materials;
- Please choose the model with oil seal in places with grinding fluid, oil mist, iron powder, cutting, etc.;
- Keep away from heat sources such as stoves;
- Do not use the motor in a closed environment. A closed environment will cause the motor to become hot and shorten its service life.

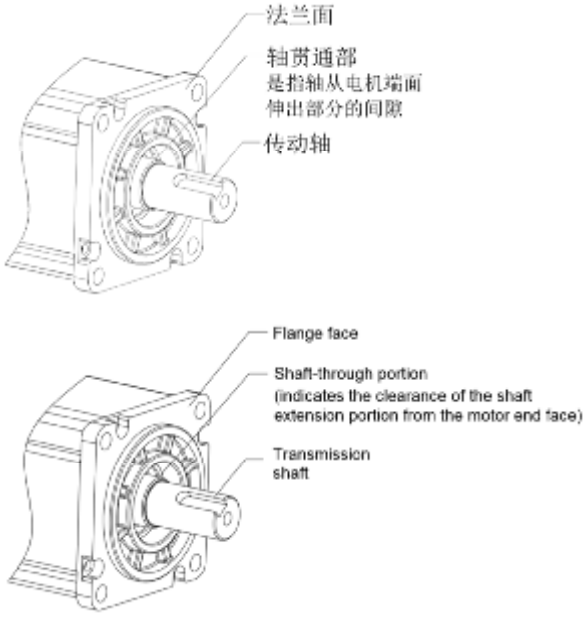
3.5.7.2、环境条件 Environmental conditions

项目Item	描述
使用环境温度 Ambient temperature	0~40°C （不冻结Not freeze）
使用环境湿度 Environmental humidity	20%~90%RH （不结露No condensation）
储存温度 Storage temperature	-20°C ~60"C （最高温度保证：80°C 72小时Maximum temperature guarantee: 80° C 72 hours）
储存湿度 Storage humidity	20%~90%RH （不结露No condensation）
振动vibration	49m/s2以下 49m/s2 or less
冲击Shock	490m/s2 以下 490m/s2 or less
防护等级 Protection level	H1、H4 IP65（轴贯通部分，电机连接器连接端子部分除外） 其它：IP67（轴贯通部分，电机连接器连接端子部分除外） H1, H4 IP65 (except shaft penetration part, motor connector connection terminal part) Other: IP67 (shaft penetration part, except motor connector connection terminal part)
海拔altitude	1000m以下，1000m以上请降额使用。 Below 1000m, please derate for use above 1000m.

3.5.7.3、安装注意事项 Installation Precautions

项目 Item	描述
防锈处理 Anti-rust treatment	安装前请擦拭干净伺服电机轴伸端的“防锈剂”，然后再做相关的防锈处理。 Before installation, please wipe clean the "anti-rust agent" on the shaft extension end of the servo motor, and then do the relevant anti-rust treatment.
编码器注意 Encoder attention	安装过程禁止撞击轴伸端，否则会造成内部编码器碎裂。 It is forbidden to hit the shaft extension end during installation, otherwise the internal encoder will be broken.  ❙ 当在有键槽的伺服电机轴上安装滑轮时，在轴端使用螺孔。为了安装滑轮，首先将双头钉插入轴的螺孔内，在耦合端表面使用垫圈，并用螺母逐渐锁入滑轮 ❙ 对于带键槽的伺服电机轴，使用轴端的螺丝孔安装 ❙ 对于没有键槽的轴，则采用摩擦耦合或类似方法。 ❙ 当拆卸滑轮时，采用滑轮移出器防止轴承受负载的强烈冲击。 ❙ 为确保安全，在旋转区安装保护盖或类似装置，如安装在轴上的滑轮。 ❙ When installing a pulley on a servo motor shaft with a keyway, use a screw hole at the shaft end. To install the pulley, first insert the double-headed nail into the screw hole of the shaft, use a washer on the surface of the coupling end, and gradually lock the pulley into the pulley with a nut ❙ For the servo motor shaft with keyway, use the screw hole on the shaft end to install ❙ For shafts without keyways, friction coupling or similar methods are used. ❙ When disassembling the pulley, use the pulley remover to prevent the

	bearing from being strongly impacted by the load. ❙ To ensure safety, install a protective cover or similar device in the rotating area, such as a pulley installed on the shaft. 
定心 centering	在与机械连接时，请使用联轴节，并使伺服电机的轴心与机械的轴心保持在一条直线上。安装伺服电机时，使其符合左图所示的定心精度要求。如果定心不充分，则会产生振动，有时可能损坏轴承与编码器等。When connecting with the machine, please use the coupling, and keep the axis of the servo motor and the axis of the machine in a straight line. When installing the servo motor, make it meet the centering accuracy requirements shown on the left. If the centering is insufficient, vibration will occur, which may damage bearings and encoders. 
安装方向 Installation direction	伺服电机可安装在水平方向或者垂直方向上。 The servo motor can be installed horizontally or vertically.
油水对策 Oil and water countermeasures	❙ 请勿将电机、线缆浸在油或水中使用； ❙ 在有水滴滴下的场所使用时，请在确认伺服电机防护等级的基础上进行使用。（但轴贯通部除外） ❙ 在有液体的应用场合，请将电机接线端口朝下安装（如下图），防止液体沿线缆流向电机本体； ❙ Do not immerse the motor and cable in oil or water for use; ❙ When using in a place with dripping water, please use it after confirming the protection level of the servo motor. (Except for shaft through part) ❙ In liquid applications, please install the motor wiring port downwards (as shown below) to prevent the liquid from flowing to the motor body along the cable;  ❙ 在有油滴会滴到轴贯通部的场所使用时，请指定带油封的伺服电机。

	❙ 带油封的伺服电机的使用条件: Ø 使用时请确保油位低于油封的唇部； Ø 垂直向上安装伺服电机时，请勿使油封唇部积油。 Ø When using in a place where oil drops will drip onto the shaft through part, please specify a servo motor with an oil seal. Ø Using conditions of the servo motor with oil seal: Ø Please make sure the oil level is lower than the lip of the oil seal when using; Ø When installing the servo motor vertically upwards, do not allow oil to accumulate on the oil seal lip. 
线缆的应力状况 Cable stress	不要使电线“弯曲”或对其施加“张力”，特别是信号线的芯线为0.2mm或0.3mm，非常细，所以配线（使用）时，请不要使其张拉过紧。 Do not "bend" the wire or apply "tension" to it, especially the core wire of the signal wire is 0.2mm or 0.3mm, which is very thin, so when wiring (use), please do not make it too tight.
连接器部分的处理 Processing of the connector part	有关连接器部分，请注意以下事项Regarding the connector part, please note the following： ❙ 连接器连接时，请确认连接器内没有垃圾或者金属片等异物。 ❙ 将连接器连到伺服电机上时，请务必先从伺服电机主电路线缆一侧连接，并且主线缆的接地线一定要可靠连接。如果先连接编码器线缆一侧，那么，编码器可能会因PE之间的电位差而产生故障。 ❙ 接线时，请确认针脚排列正确无误。 ❙ 连接器是由树脂制成的。请勿施加冲击以免损坏连接器。 ❙ 在线缆保持连接的状态下进行搬运作业时，请务必握住伺服电机主体。如果只抓住线缆进行搬运，则可能会损坏连接器或者拉断线缆。 ❙ 如果使用弯曲线缆，则应在配线作业中充分注意，勿向连接器部分施加应力。如果向连接器部分施加应力，则可能会导致连接器损坏。 ❙ When connecting the connector, make sure that there is no foreign matter such as garbage or metal pieces in the connector. ❙ When connecting the connector to the servo motor, be sure to connect it

	from the side of the main circuit cable of the servo motor first, and the ground wire of the main cable must be reliably connected. If you connect one side of the encoder cable first, the encoder may malfunction due to the potential difference between PEs. l When wiring, please make sure that the pin arrangement is correct. l The connector is made of resin. Do not apply shock to avoid damage to the connector. l Be sure to hold the main body of the servo motor when carrying out transportation operations with the cables connected. If you only hold the cable and carry it, you may damage the connector or pull the cable. l If you use a bent cable, you should pay sufficient attention during the wiring work to not apply stress to the connector part. If stress is applied to the connector part, the connector may be damaged.

3.6、切割机基本参数及安全操作指导 Basic parameters of cutting machine and safe operation guidance

3.6.1、总则 General rules

本使用说明书随机附送，按照本使用说明书的指导正确地使用机器，有助于保障人机安全，减少维修和停机时间，增强机器的可靠性，延长机器的使用寿命，提高经济效益。

This manual sent together with machine, the user need to operate the machine obey the instruction to guaranty personal and machine safety, reduce repair and machine stop time, increase the machine reliability, lengthen the machine life, improve the benefits.

机器操作人员必须熟读并理解本说明书内容，本说明必须置于机器附近，以便拿取。

The machine operator should read this book carefully and understand the contents of this manual, this instruction must be placed near the machine for easy access.

操作机器除要遵守本说明书所规定的安全指导外，还必须遵守其它相关专业所规定的安全守则。

The machine operator should read this book carefully and obey the safety rules not only mentioned in this book, but also in other correlative professional books.

本机器的设计能保障操作者在遵守本说明书规定的前提下，安全地装卸、使用、维护。在做任何有关机器装卸、清洁、维护、维修工作前，都应先切断电源，以防意外起动。任何因违反本说明书的规定而造成的损害，概不在本保证范围内。

The design of the machine can secure the operator, in the guiding of this manual, to load and unload, operate and maintenance. In any circumstances, such as loading and unloading, cleaning, maintenance and repair , please cut down the power off first to prevent accidental starter. Any damage resulted from disobeying this manual is afforded by the operator.

我们对机器的改进持保留权，但任何技术上的改进，若未改变机器的功用，则不修改说明书。

We reserve the rights of improving this machine, but any improvement in technique, without change the machine's function; we will not modify this manual.

本机器只能在定购单上(合同)要求的使用范围内工作，任何超越此范围的使用都是不合规定的，由此而造成的一切后果，由使用者负责，制造商概不负责。

The work of this equipment should reference the contract, any work which beyond this work scope will treat as the illegal work. All accident caused by above illegal, the supporter will has no responsibility.

以下情况不允许操作机器：It’s forbidden to operate on the machine in following cases:

- Ø 机器主随意更换机器零部件Change the parts randomly.
- Ø 安全装置不全或失效 Lack of safety device or out of work
- Ø 没有完全阅读并了解本说明书Do not understand the instruction fully.

3.6.2、安全 Security

3.6.2.1、设备工作的环境要求 Environment requirement

- 允许环境空气温度：+5℃～35℃； Allowable temperature: +5℃～35℃；
- 贮运温度：-20℃~55℃； Storage temperature: -20℃~55℃；
- 相对湿度：至80%，无凝露； Relative humidity: up to 80%; without condensation of water;
- 污染等级：2级，不应安装在多粉尘，有腐蚀性气体的场所； Pollution class: 2-class,the installation place should not be with dust or corrosion air.
- 海拔高度：<1000米，>1000米须降容使用，每升高100米，负载能力降1%。Altitude:<1000 M; if the altitude >1000 M, when each time increase 100M,the load carrying will decrease by 1%.

3.6.2.2、电源要求 Power requirement

- 供电形式：三相五线制，即TN-S系统（3P/N/PE）
  Electricity providing type: 3-phase 5-wires type; that is TN-S system(3P/N/PE)
- 三相电压：380V±10% 单相电压：220V±10%
  3-phase voltage:380V±10%; single-phase voltage:220V±10%;
- 电源频率：50Hz Power frequency:50HZ

3.6.2.3、人员要求 Requirement personnel

- 只有经过培训合格的人员才能操作机器，而且必须是由机器主授权。
  After the standard training, who will have the ability to operate machine, and the user should authority to him also.
- 机器的连接，安装，维护，维修工作必须由经过培训的专业人员担当。
  Connection, installation and maintenance work of the machine should undertake by the professional operator.
- 培训中的人员操作机器，必须在具有丰富经验的员工的监察中进行。
  The operator who is under training ,when operate the machine should be supervised by the experienced worker.
- 机器主明确规定机器操作，维护，维修者所需要具备的能力要求。
  The machine owner should require definitely of the operators' the ability.

3.6.2.4、机器主的义务 User obligation

- 本操作手册应放在机器附近易拿到的地方。
  This brochure should be in a right place, so as to convenient to reference.
- 机器主必须遵守一般的正确规定，法律，注意防止事故的产生。
  In order to avoid unnecessary accident, the user must follow relative operation, maintenance or protection rules.
- 应重视本说明书提供的指导，定期检查生产，保持安全意识。
  Checking the working conditions regularly and keeping safety awareness in the guidance of this manual.
- 按说明书规定的要求对机器进行维护。
  According instruction book to carry out all maintenance work.

3.6.2.5、意外防止注意事项 Attention

- 操作者必须经培训合格，熟悉并理解本说明书提供的内容。
  The operator must be qualified for training, and should know the contents of the book quite

well.

- 按本说明书规定，对机器进行的操作、调整、维护、维修。
  All operation, adjustment, maintenance and protection work should reference instruction book
- 机器运行前应检查安全装置是否有效。
  Make sure all safety device are available , before carry out operation work.
- 对机器进行调整，维护，维修前必须将开关关闭。
  Cutting off all switch, when carrying out adjustment and maintenance work.

3.6.2.6、机器操作注意事项 Operation attention

- 机器开启前应确保无人处于危险区域，对机器进行任何操作都必须事先通知相关同事；
  Make sure no people in the dangerous zone, before starting up machine, all operation work for machine need to be know by all relative people.
- 机器运转时，严禁把安全门打开；
  Do not open the security door when the machine is on work.

- 机器运转时，严禁攀爬机器；
  Don’t try to climb to the machine when it’s on work.
- 不要留长发，穿松散衣服，或带手饰。
  No long hair, loose clothes or with jewelry.

3.6.2.7、机器维护，维修应注意事项 Machine maintenance and attention issue

- 在未征得供应商的同意下，严禁任何影响机器安全的改动。
  without manufacturer allowance, any changing work which will affect safety thing are not allowed.
- 维护、维修工作请按本说明书所述，关掉机器，将主开关锁死，并在其附近设置警告标志以防意外起动。
  All maintenance and operation work need to reference instruction book, switch off machine, and lock the main switch, and set a notice sign, so as to avoid accident activation.
- 严禁带电维护，维修电器。
  It is strictly prohibited to carry out all protection and maintence work, under the condition of

machine is charged.

3.6.2.8、安全标识的解释说明 Explanation of the security mark

- 为了提醒操作人员在操作过程中避免造成人身伤害，本设备在许多有人身伤害危险的部位张贴了相应的安全警告标志，请在生产和调试，以及保养维护的过程中，不要把这些安全警示标志移位，在拆卸修理机器时，需要移动或者拆下某些标志，请在完成相应的工作之后，将它们安装回原来的位置。

In order to remind the operating personnel to avoid causing personal injury in the operating process, this production line posted corresponding security warning signs in many dangerous parts, please don't put these warning signs shift in the process of production and commissioning, If you need to move or tear down some signs when removing and repairing machine, please install them back to where they were after completing the corresponding working.

- 以免因为地区和国家在安全警示标志意义上的差别，在此特别解释本生产线上的安全警示标志的具体意义，请操作人员在操作机器之前，先了解以下这些安全警示标志的意义。

Because regional and national safety warning signs significance are different, so here, we particularly interpreted specific meanings of safety warning signs in this line, the operators should know them before operating the machine.

注意！当接通电源后禁止打开任何电线盖、电线管和插头，不然操作者有触电的危险！

Notice! Forbid to open any wire cover, wire tube and plug when switched on, otherwise the operators will have the risk of electric shock!

罩中存在高速旋转运动的危险，操作人员除维修外不得拆掉或者换位！

There is the danger of high speed rotation in the cover, the operator shall not remove or take it down except maintenance!

设备温度较高，操作时请戴防高温手套！ Using gloves avoid to high temperature！

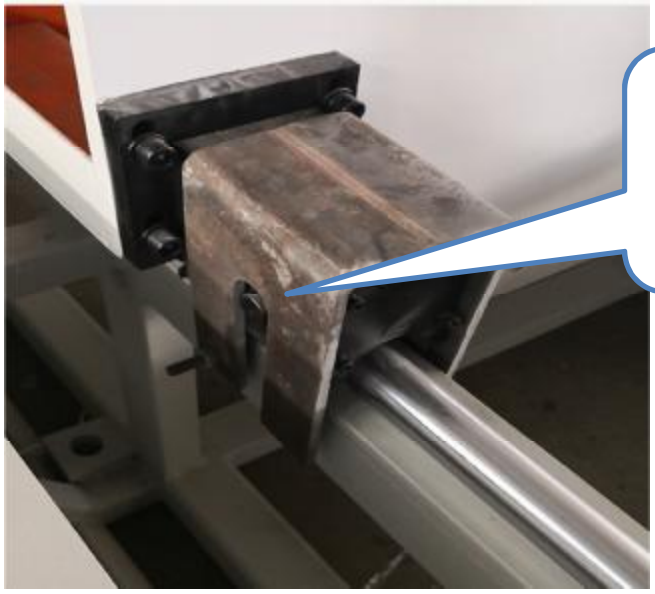
3.6.3、运输和安装 Using gloves avoid to high temperature

3.6.3.1、整体运输 transporting whole set machine

整体运输时，要有适当的支撑和固定。Supporting frame and tension is really necessary when transporting whole set machine.

在运输前要用固定板将移动锯台与底架固定结实，以防止在运输过程中滑动，在安装完试车前要将其拆除。

Fix the moving saw table and the bottom frame with a fixed plate before transportation to prevent sliding during transportation, and remove it before installing the test vehicle.



3.6.3.2、用叉车运输 Transportation of forklift

- 叉车操作员必须是经过培训并取得操作许可证的；
  The operator of forklift should be trained and acquire relative certificate.
- 注意机器的重心；
  Pay more attention to machine center of gravity.
- 叉起机器时，所有人员需立即离开危险区
  When forking the machine, all people should leave far away from the dangerous zone.

3.6.3.3、安装 Installation

本设备的就位与安装通常与生产线的其它装置一起进行，安装时必须遵循有关的外形尺寸图和基础图，机器与水泥地面采用地脚膨胀螺栓固定。

The machine in place and installation usually with other plant production lines, must follow the relevant dimension drawing and foundation drawing installation, extruders and cement floor using the foot expansion bolt.

3.6.3.4、行星切割机的吊运 Cutter lift and transportation

- 起重操作员必须是经过培训并取得操作许可证的；
  The operator must be trained and have operation permit.
- 吊起机器时，所有人员需立即离开危险区域；
  All people should leave away the danger area when lifting the machine
- 不能使用已受损的绳索或链条；
  No using of the damaged cord or chain.
- 不能超过绳索或链条所能承受的负荷；
  Load should not be excess the maximum permission of the cord or chain.

- 见上图，若采用绳索起吊机器时，必须先将起吊环完全旋紧到根部；

As shown in the above figure, if the rope is used to lift the machine, the lifting ring must be fully screwed to the root.

- 由于切割机重量分布不平衡会导致搬运过程中的重心偏移，为防止吊索在吊钩中滑动，套在吊钩中的绳索必须在钩上再多绕一圈。

Because the extruder weight is not uniformity, when lifting, it will lead the rope to move around, so we advise to make strong tie on the hook, it better make twice.

3.6.3.5、场地条件 Space requirement

切割机必须安装在非常平整的水泥地坪上，若是地面不平则需将地面垫平，采用水平仪检验切割机的水平度（前后左右不得大于0.3mm）；切割机的中心要与挤出模具的中心同心，同心度不得大于0.5mm。校好水平及中心后采用膨胀螺丝固定。

The cutter must be installed on a very flat cement floor. If the ground is not flat, need to level the ground. The level of the cutter should be checked with a gramoldnter (no more than 0.3mm before and after). The center of the cutter should be concentric with the center of the mold, and the concentricity should not exceed 0.5 mm. Fix the level and center and fix it with expansion screws.

3.6.4、切割机操作说明 Operation instruction of cutter

3.6.4.1、概述 Summarize

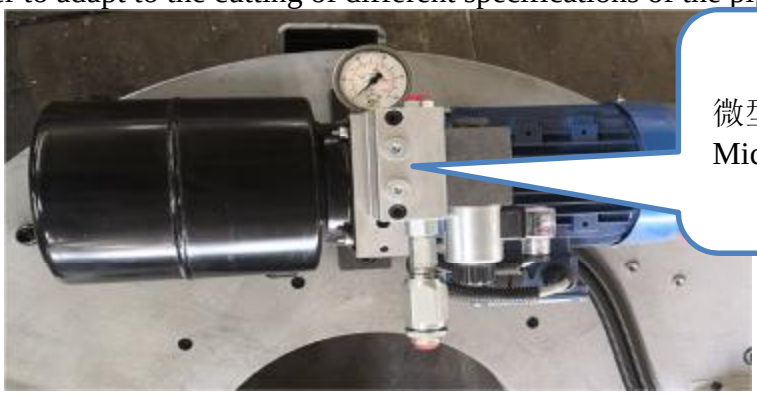
圆刀无屑切割机用于管材的定长切割，在切割过程中机架上的移动锯台可以沿着挤出方向移动，并保持与管材的同步。在机器的前部和后部装有托轮装置，托轮起到支撑和导向的作用，不同管径时要予以调节。当编码器发出切割信号后，圆刀无屑切割机的夹紧装置夹牢管材，使管材在切割过程中相对固定，夹紧装置为自定心旋转夹紧，在生产不同规格的管材时，省去更换哈夫的过程。

Round Blade No dust cutter used in pipe fixed length cutting, the movement of the machine frame in the process of cutting saw machine can move along the extrusion direction, and keep synchronization with pipes. The machine is equipped with the front and the rear roller device, roller have the effect of support and guidance, different pipe diameter should be adjusted. When the encoder signal cutting, Round Blade No dust cutter clamping device clip pipe material, make the pipes in the cutting process is relatively fixed, the clamping device is self-centering rotary

clamping, in the production of different specifications of the pipes, replace the corresponding hough block.

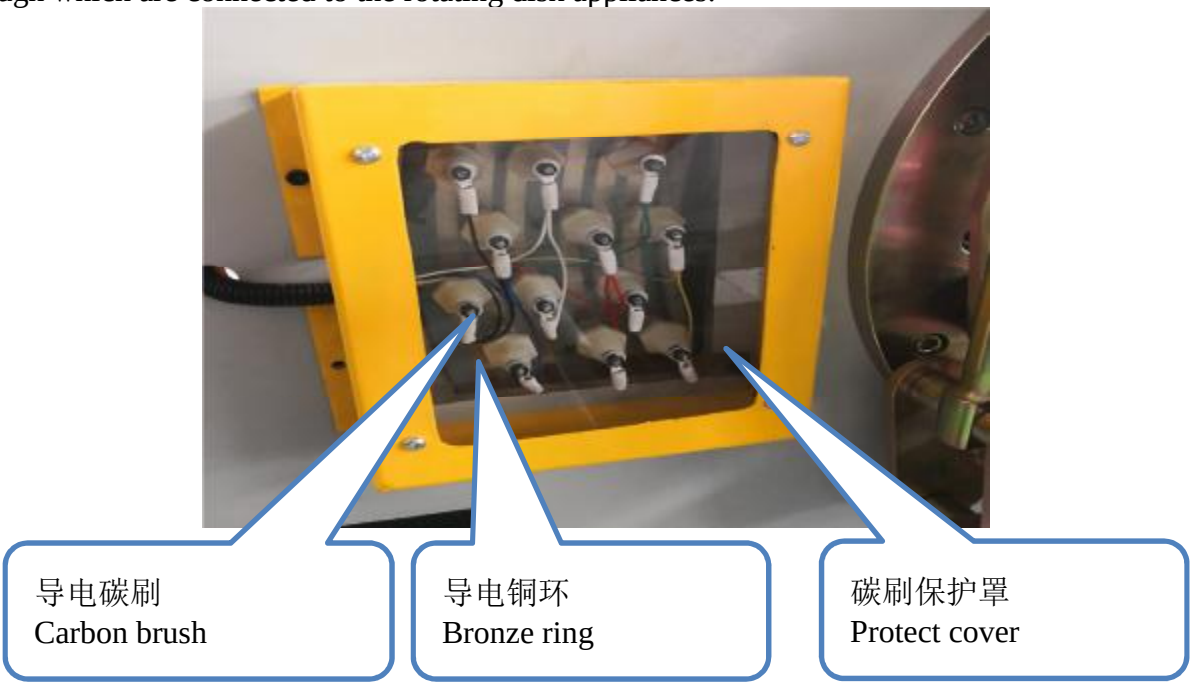
切割装置的刀片由液压缸推动，刀片的进给是通过液压缸缓慢推进而进行的，油缸推力的大小可由液压泵站的溢流阀调节。详见微型液压泵站说明书。刀片的行星转动由旋转装置来完成的，其旋转盘由大型轴承支撑和定位，所以旋转中心不变使切割机切割管材端面平整，尺寸规范。进刀深度在屏幕上可自由设置，通过进刀时间的长短来控制进刀的深度。不同规格的管材，通过油缸调节底座上的丝杆来调整刀片的原始位置，来适应不同规格管材的切割。

The blade of the cutting device is pushed by the hydraulic cylinder, the saw blade cutting feed was conducted by hydraulic cylinder slow progress, the size of the oil cylinder thrust can be adjusted by hydraulic pump station of overflow valve. See miniature hydraulic pump station instruction. Saw blade of planetary rotation are done by rotating device, rotate by the large bearing and its orientation, so the center of rotation is constant to make flat end face cutting machine for cutting the pipe, and size specification. The depth of the feed can be set freely on the screen, and the depth of the feed can be controlled by the length of the feed time. Different specifications of the pipes, adjust the original position of the blade by adjusting the screw on the base of the cylinder to adapt to the cutting of different specifications of the pipe.



旋转装置内腔装有导电铜环，外部电源通过它与旋转盘上的电器相连。

Rotating device inside the cavity containing conductive copper ring, external power supply through which are connected to the rotating disk appliances.



3.6.4.2、技术参数 Cutter technical specifications

规格型号 Model / 技术参数 Parameters	Φ630	Φ500	Φ315
切割管径 mm Cutting pipe size mm	250~630	110~500	50~315
锯台移动速度 m / min Saw table Move speed m / min	最大 2 MAX 2	最大 3.5 MAX 3.5	最大 5 MAX 5
刀片直径 mm Saw size mm	230	230	160
旋转电机功率 KW Rotary motor power KW	4	4	2.2
最快切割时间 S/次 Fastest cutting time S/次	35-80	35-70	20-50
移动最大行程 mm Max. move stroke mm	2000	2000	2000
气压 MPa Pressure MPa	0.4-0.6	0.4-0.6	0.4-0.6

3.6.4.3、调试 Commissioning

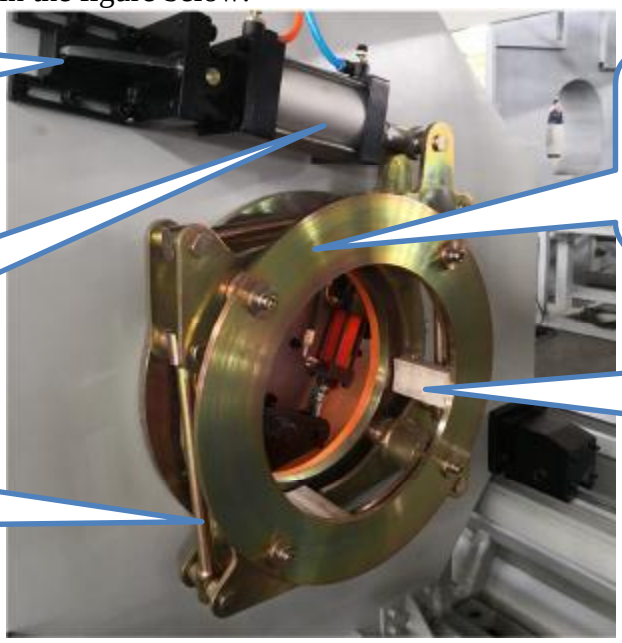
3.6.4.3.1、旋转夹紧机构 Rotary clamping mechanism

夹紧采用气动夹紧方式，通过一个气缸拉动连杆机构自动定心夹紧。该夹紧机构可适应不同规格的管材，不需要更换夹块。其主要机构包括：气缸、连杆、夹块等组成。

Clamping adopts pneumatic clamping method, through an automatic centering clamping cylinder pull rod system. The clamping mechanism can be adapted to different specifications of the pipe material,do not need to replace the clamp block. The main institutions include: Cylinder, connecting rod, clamp, etc.

其结构如下图所示：

Its structure as shown in the figure below:



3.6.4.3.2、前后拖轮 Before and after the adjustment of the roller

前后托轮的调节是在夹紧装置将管材夹紧后进行，将托轮调至管材处于水平状态。

Before and after the adjustment of the roller is in the clamping device will be performed after the pipe clamp and the roller to steel tubes in a state level

3.6.4.3.3、切割深度 cutting depth

切割深度在屏幕上可自由设置，通过进刀时间的长短来控制进刀的深度。

The cutting depth can be set freely on the screen, and the infeed depth can be controlled by the length of the infeed time.

3.6.4.3.4、液压系统压力调节 hydraulic system pressure regulation

液压系统的压力调节通过调节装在旋转盘上的微型液压泵站的流量阀来实现的。流量阀1用来调整松油压的大小，流量阀2用来调节进刀的快慢，拧开锁紧螺母，右旋螺钉压力增高，但不能超过齿轮泵的额定压力6Mpa，反之减低。

Hydraulic system pressure adjustment by adjusting mounted on the rotating disk miniature hydraulic pump station of flow valve. The flow valve 1 is used to adjust the size of the loose oil pressure and the flow valve 2 is used to adjust the speed of the feed. Loosen the lock nut and right screw pressure increased, but it cannot exceed the rated pressure of the gear pump by 6Mpa, and vice versa.

注意：出厂时压力器调节好，非专业人士不要随意调整。

Attention: The pressure gauge is adjusted at the factory, and non-professionals should not adjust it at will.

适当的液压，油缸才能很好地将锯臂压在管材上使刀片完成切割。如果压力太大薄臂管材会变形。压力过低则进刀不到位。

With proper hydraulic pressure, the cylinder can properly press the saw arm against the pipe to complete the cutting. If the pressure is too high, the thin arm tubing will deform. If the pressure is too low, the feed is not in place.

3.6.4.3.5、刀片进给速度的调整 saw blade feed speed adjustment

流量阀2用来调节进刀的快慢，拧开锁紧螺母，右旋螺钉进刀速度变快，反之变慢。

Throttle valve 2 is used to adjust the blade feeding speed. Loosen the nut right screw speed increase, whereas decreases.

3.6.4.3.6、旋转盘速度 rotate speed

旋转盘有电机通过减速器和一对齿轮传动的，电机可调速。旋转盘的速度调整按下述原则进行：

Rotate with the motor through reducer and a pair of gear transmission, motor adjustable speed. Rotate speed adjustment according to the following principles:

小管或薄管须高速，大管或厚管须低速。在切割厚管时，如果转速太高，刀片会过热，管材切完会有白边。电机调速从控制面板上的电位器控制。

Small tube or thin tube must be high speed, big tube or thick tube must be slow speed. When cutting thickness, if the speed is too high, the blade will overheat and the tube will be write. Motor speed control potentiometer control from the control panel.

3.6.4.4、电气操作步骤 Electrical operation steps

3.6.4.4.1、工作流程 Work process

在自动状态下，长度达到设定值——锯台移动、夹紧块夹紧——大盘公转——进刀延时时间到，开始进刀——进刀时间到，停止进刀、停止公转——大盘反转、退刀——碰到退刀限位，停止退刀——夹紧块松开、锯台复位，完成一个切割周期，等待下一个长度信号。

In the automatic state, the length reaches the set value——saw table movement, clamping block clamping——large disc revolution——feed delay time is up, start feed——feed time is up, stop feed, stop revolution——The reversal of the large disc, retracting the knife——hitting the retraction limit, stopping the retraction——the clamping block is loosened, the sawing table is reset, a cutting cycle is completed, and the next length signal is awaited.

3.6.4.4.2、操作流程 Operating procedures

- 在开机前，首先切换到手动状态，分别按下各个手动按钮操作相应的机构，观察各个动作是否正常，具体按钮的功能见后面操作界面介绍。

  Before starting the machine, first switch to the manual state, press each manual button to operate the corresponding mechanism, and observe whether each action is normal. The function of the specific button is described in the following operation interface.
- 用一件与要生产的制品相同规格的管材穿入前后夹紧块之间，并让夹紧块夹紧，通过手动调节丝杆调节刀片的起始位置，刀片调节至距离管材表面8-10毫米左右，调节好进刀压力（15mm壁厚左右的管子调节压力在3MPa左右，30mm壁厚左右的管子调节压力在4MPa左右，45mm壁厚左右的管子调节压力在5MPa左右）和进油的速度以及进刀的时间和公转速度。

  Use a pipe of the same specification as the product to be produced to penetrate between the front and rear clamping blocks and clamp the clamping block. Adjust the starting position of the blade by manually adjusting the screw. The blade is adjusted to 8-10 mm from the surface of the pipe, adjust the feed pressure (the pipe adjustment pressure of about 15mm

wall thickness is about 3MPa, the pipe adjustment pressure of about 30mm wall thickness is about 4MPa, the pipe adjustment pressure of about 45mm wall thickness is about 5MPa) and the speed of oil intake. and the time of the infeed and the speed of the revolution.

注意：此距离如果太大会增加切割时间造成行程不够，距离如果太小，在工作的过程中，可能会因为振动等因素造成管材碰到刀片而断刀。

Attention: If the distance is too large, the cutting time will increase, and the stroke will be insufficient. If the distance is too small, during the working process, the pipe may be broken due to vibration and other factors.

- 根据后面操作界面介绍的方法设定好各个参数，设定好后按下切割准备后，再按手动切割切割一次，观察切割动作是否正常。
  According to the method described in the following operation interface, set each parameter. After setting it, press the cutting preparation, then press the manual cutting and cut once to see if the cutting action is normal.
- 切割动作正常后，切换到自动状态，等待生产线正常运行后，将编码器放到正确位置，编码器开始计长。此时按下手动切割，执行一次切割动作，编码器计数清零，重新开始计数。后面即按照设定的长度自动运行。
  After the cutting action is normal, switch to the automatic state, wait for the production line to run normally, put the encoder in the correct position, and the encoder starts counting. At this time, the manual cutting is pressed, a cutting action is performed, the encoder count is to clear, and the counting is restarted. The latter will automatically run according to the set length.

提示：在生产线没有正常运行，管材没有完全成型时，请切换到手动状态，禁止处在自动状态使用切割机，以免因管材的不规则和接头等因素造成断刀。如需手动切割，也要注意观察切割的位置不是接头的地方或者管材不规则的地方。

Attention: When the production line is not operating normally and the pipe is not fully formed, please switch to the manual state. It is forbidden to use the cutting machine in the automatic state to avoid the broken knife due to irregularities of the pipe and joints. If manual cutting is required, also pay attention to the place where the cutting position is not the joint or the pipe is irregular.

3.6.4.5、操作界面介绍　Panel screen introduction

3.6.4.5.1、启动画面　Start screen

图（1）Picture (1)

l　屏幕右侧显示的两个国旗图标为 英/中文的切换。如上图 ： 图（1）

The two flag icons displayed on the right side of the screen are English/Chinese switching. As shown above Please see the picture (1)

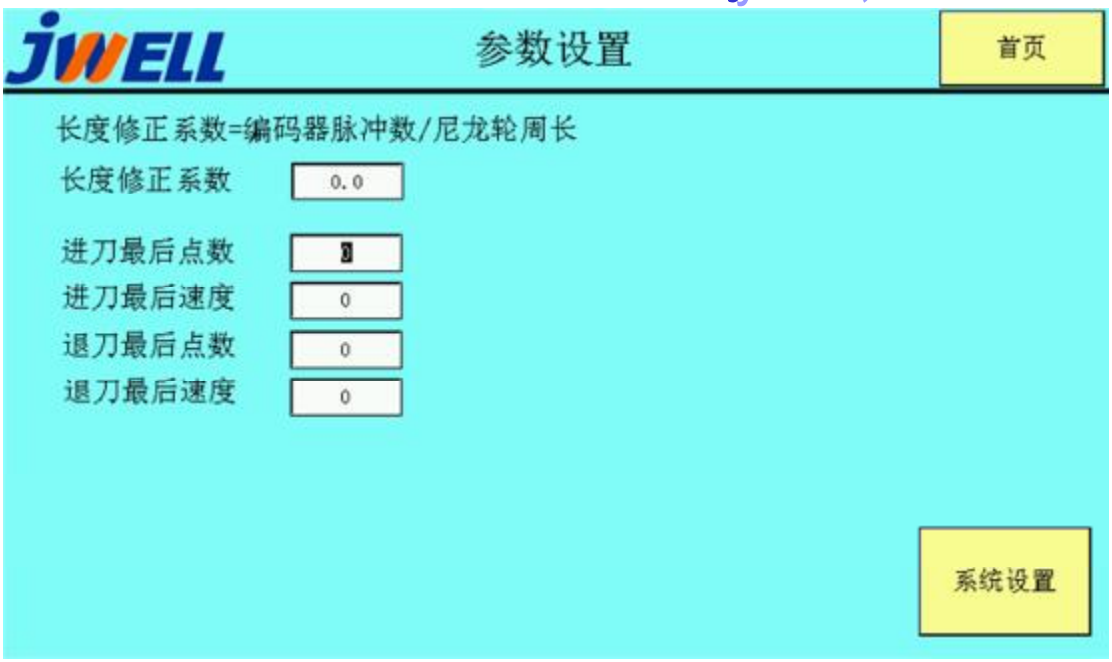
3.6.4.5.2、进入参数设置画面　Parameter set picture

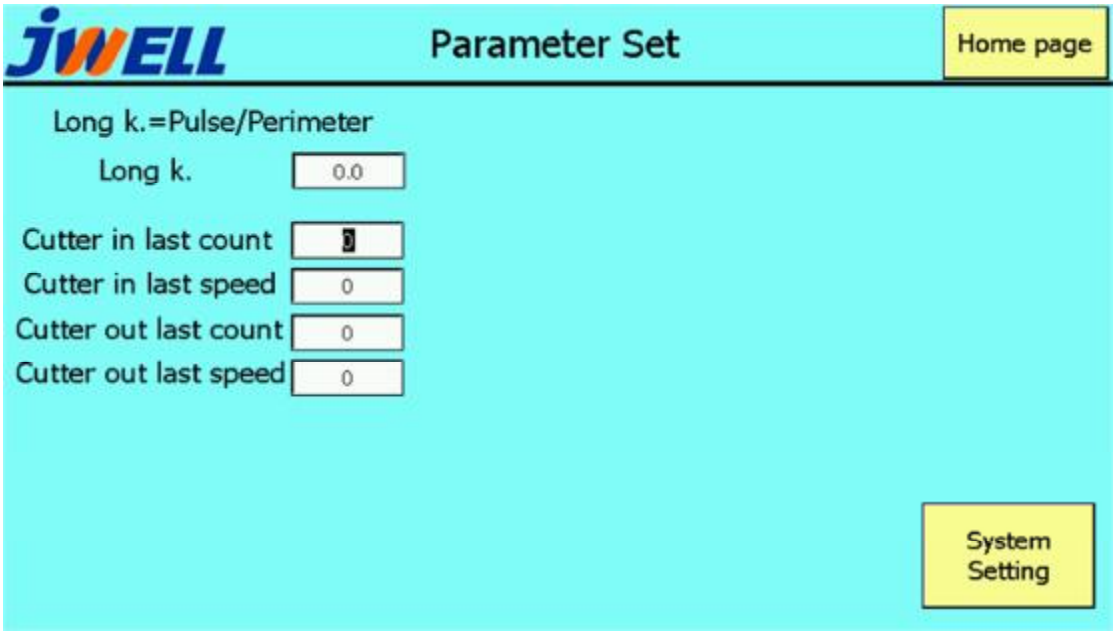
l　点击 **参数设置** 键进入登入页面 图（2）

Click on the parameter settings to enter the login screen，Please see the picture(2)

图（2）Picture (2)

l　输入用户：**123** 密码：**300** 点击确定，重新点击**参数设置**键就进入设置页面了。如下图（3）





图（3）Picture (3)

First, require users : 123 Password:300 then Click Ok, again click on the parameter settings, you can enter the set screen. Please see the picture (3)

- 长度修正系统：：当切割下来的管材长度与设定的长度不一致时，使用此参数修正。
  Length Correction System: When the length of the cut pipe does not match the set length, use this parameter to correct

设定举例：如设定长度是6米，而切割下来的管材长度是12米，则此参数设置为6/12=0.5。

One example： If the set length is 6 meters and the length of the cut pipe is 12 meters, this parameter is set to 6/12=0.5.

- 此圆刀切割机没有进刀最后点数，进刀最后速度，退刀最后点数，退刀最后速度参数，所以不需要设置。
  Round Blade Cutting does not have the last point of the infeed , the final speed of the infeed,

the last point of the retraction, and the final speed parameter of the retraction, so no need to setting

- 设置完成后点击**首页**返回到启动画面。
  After the setting is completed, click the home page to return to the startup screen.

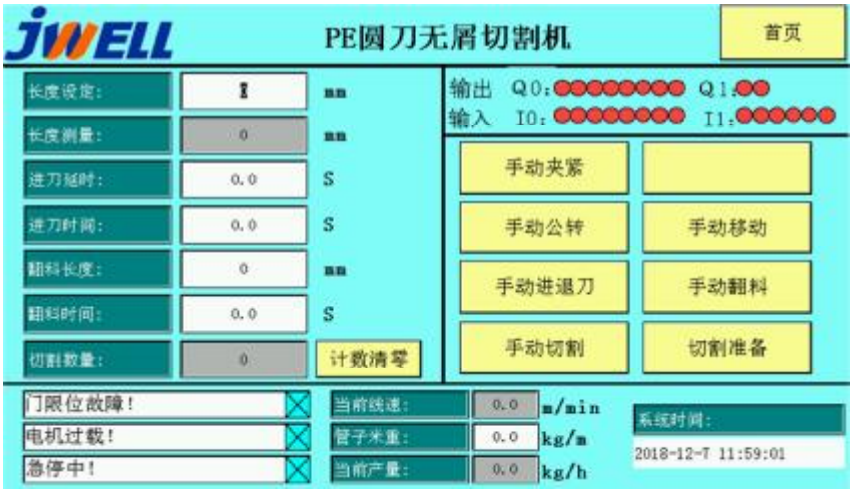
3.6.4.5.3、进入系统 Enter the system

- 启动画面图(1)然后点击**进入系统** 键进入切割机类型选择页面。（如下图4）Start the screen (the picture(1)) then click enter the system to select cutter type interface.(As shown below(4))

图（4）Picture (4)

- 系统会自动确认切割机类型（显示为绿色）点击进入即可。
  The system will automatically confirm the type of cutting machine(Green area),click to enter.

3.6.4.5.4、系统参数设置 Parameter set



图（5）Picture (5)

- 长度设定：设定需要切割的管材长度。单位毫米。
  Length setting：Setting required pipe length. Unit mm
- 长度测量：显示编码器实测的当前长度。单位毫米。
  Length measurement: Display the current length measured by the encoder. Unit: millimeter

设定举例：需要切割的管材长度为6米，则设定为6000。

Setting example: The length of the pipe to be cut is 6 meters, then set to 6000.

- 进刀延时：夹具夹紧管材后经过的时间再开始进刀。单位秒。
  Cutting feed delayed: fixture clamping pipe After the time passed before starting to enter the knife.Unit seconds

设定举例：测量刀片位置距离翻料架前端的长度，比如是3.5米，则设定为3500，也就是切割完成后，再经过3.5米翻料。

Setting example: Measure the length of the blade position from the front end of the turning rack, such as 3.5 meters, then set to 3500, that is, after cutting, and then through 3.5 meters turning.

- 进刀时间：刀片进入管材的时间，从原始位置到切断管材的时间。
  Incoming knife time: The time when the blade enters the pipe, from the original position to the time to cut off the pipe.
- 翻料长度：设定管材切割完成后经过的长度再翻料。单位毫米。

Material turning length: set the length after cutting the pipe and turn over the material. Unit: millimeter.

设定举例：测量刀片位置距离翻料架前端的长度，比如是3.5米，则设定为3500，也就是切割完成后，再经过3.5米翻料。

Setting example: Measure the length of the blade position from the front end of the turning rack, such as 3.5 meters, then set to 3500, that is, after cutting, and then through 3.5 meters turning.

- 翻料时间：设定翻料架从翻下到回位的时间。
  Flip Time: Set the time of the flip frame from the flip down to the return position.
- 切割数量：此画面记录切割下来的管材数量。因PLC内存有限，所以当数量达到1000000时自动清零并重新开始记录。如需手动清零，则按一下计数清零即可。
  Cutting Quantity: This screen records the number of tubes cut down. Because PLC memory is limited, automatically clear 0 and restart recording when the quantity reaches 1000000. If you want to manually clear the zero, click the Count clear 0 can be.

3.6.4.5.5、手动操作说明画面 manual Operation instructions Screen

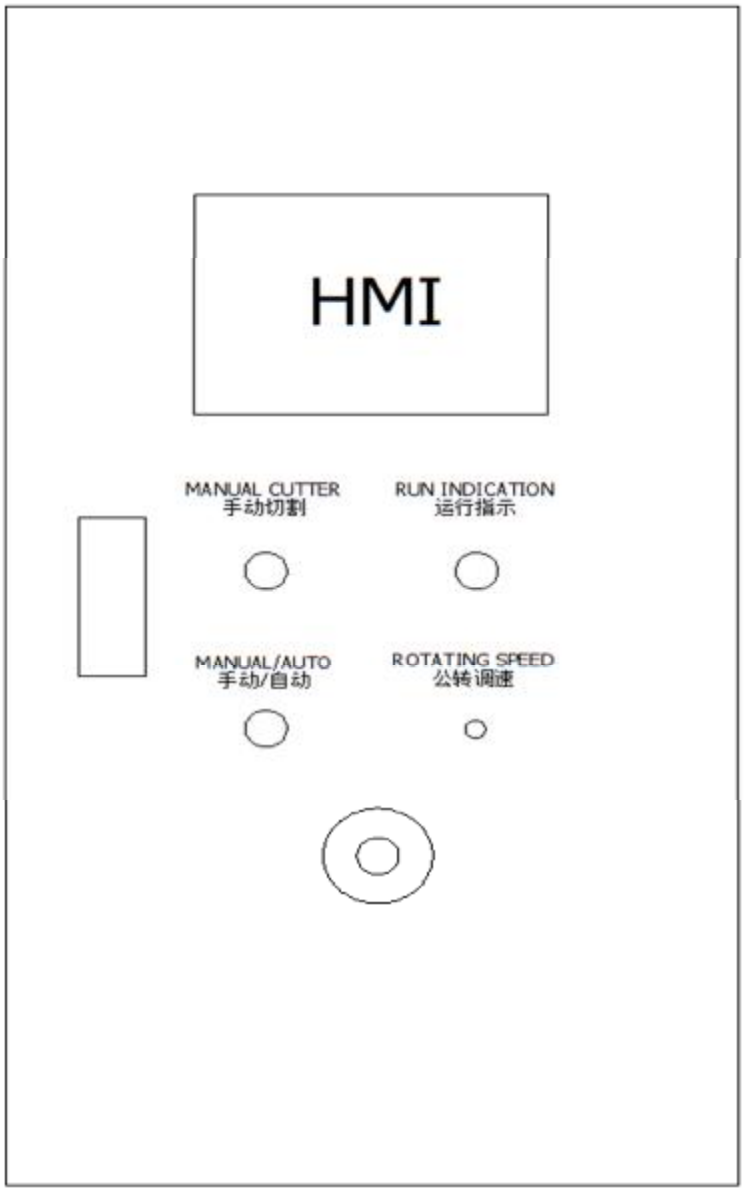
- 手动夹紧--按一下时夹紧块夹紧，再按一下时夹紧块放松，以此类推。Manual clamping-Tighten the clamping block when pressed, then press the clamping block to relax, and so on.
- 手动公转--按下时大盘旋转。
  Manual rotation-the large plate rotates when pressed.
- 手动进退刀--按下时进刀，松开再次按下时退刀，再松开再次按下时进刀，如此反复，进退刀动作交替进行。
  Manual forward and backward knife-press the time into the knife, release the back of the knife when pressed again, and then release again when pressed into the knife, so repeatedly, the movement of the forward and backward knife alternating.
- 手动切割--此按钮在自动状态下有效。自动状态下按下此按钮，将执行一次切割动作，同时长度实测值清零。在切割管材样品时可使用此按钮。手动状态下使用此按钮需同‘切割准备’按钮配合使用，介绍如下。
  Manual cutting-This button is valid in automatic state. When this button is pressed in automatic state, a cutting action is performed, while the measured value of the length is zeroed. This button can be used when cutting pipe samples.Using this button in a manual state needs to be used in conjunction with the ' Cut preparation ' button, as described below.
- 手动移动--按一下时切割机工作台前进，再按一下时回位，以此类推。
  Manual movement-Press the cutting Machine Workbench forward, then click Back bit, and so on.
- 手动翻料--按下时翻料架翻下，经过设置的翻料时间后复位。
  Manual flip-Press When the flip rack is flipped down and reset after the set flip time.
- 切割准备--手动模式时，按下此按钮，切割指示灯由手动闪烁状态变成自动常亮状态，此时再按下‘手动切割’按钮，将执行一次切割动作，同时长度实测值清零，切割完成后，指示灯变回手动闪烁状态，可循环使用此功能。
  Cutting Preparation-Manual mode, press this button, the cutting light from the manual flashing state into the automatic constant light state, and then press the ' manual cut ' button, will perform a cutting action, while the length of the measured value of zero, after the cutting is completed, the indicator light changes back to the manual flashing state. This feature can be recycled.

图（6）Figure (6)

图（7）Figure(7)

- 上图6中显示的输入/输出点与PLC模块上的点是相对应的，是当发出命令时，相对应动作的一个显示。（红色为不动作，绿色为动作）
  The input/output point shown in Figure 6 above corresponds to the point on the PLC module and is a display of the corresponding action when the command is issued.(Red for non-action, green for action)
- 上图7中左侧显示的是切割机出现的故障报警，当出现红色不停闪烁时操作人员就能快速的发现问题并及时解决。上图7中中间显示的是管子当前的线速，当填入当前管子的米重时，可以看出当前的产量（此结果仅供参考）。上图7中右侧显示的系统的时间。
  The left side of Figure 7 above shows the fault alarm of the cutter, when the red flashes constantly flashing the operator can quickly find the problem and solve it in time. The current line speed of the pipe is shown in the middle of Figure 7 above, and the current yield can be seen when filling in the meter weight of the current pipe (this result is for reference only).The time of the system shown on the right side of Figure 7 above.

3.6.4.5.5、操作面板 Operation panel



- 手动切割：当切割机处于自动状态，即运行指示灯处于常亮时，按下一次此按钮，可使切割机完成一次切割动作。
  Manual cutting: When the cutter is in an automatic state, that is, when the running light is in constant light, press this button once, so that the cutter can complete a cutting action.
- 运行指示：常亮时为自动状态，闪烁时为手动状态。
  Run the instruction: constant light is an automatic state when flashing, and when blinking, it is a manual state.
- 手动/自动转换开关：处在左边位置为手动状态，处在右边位置为自动状态。
  Manual/Automatic switching switch: In the left position is the manual state, in the right position is automatic state.
- 公转调速：此电位器可以调整大盘旋转的速度。
  Rotation Speed regulation: This potentiometer can adjust the speed of the large plate rotation.
- 急停按钮：紧急情况下，按下急停按钮可停止所有动作。
  Quick Stop button: In case of emergency, press the emergency stop button to stop all actions.

提示：非紧急情况下，请勿使用急停按钮，否则可能会造成断刀。

Tip: In non-emergency situations, do not use the emergency stop button, otherwise it may cause a broken knife.

3.6.4.6、注意事项 matters needing attention

- 在使用切割机前，应调整切割机的中心高，使中心高与生产线中心高重合。Before using the cutting machine, the center height of the cutting machine should be adjusted so that the center height coincides with the center height of the production line.
- 选取刀片，应选取合适的刀片，安装刀片时保证刀片能够穿透制品10mm以上。
  When selecting a blade, a suitable blade shall be selected to ensure that the blade can penetrate over 10mm of the product when installing the blade.
- 在正常生产过程中，禁止打开观察门，否则会造成机器停止甚至断刀。
  In the normal production process, do not open the observation door, otherwise the machine will stop or even break the knife.
- 切割机临时不使用时，请切换到手动状态，以免因计长信号或其它误动作触发切割机工作造成事故。长时间不使用时，请断开总电源。
  When the cutting machine is temporarily not in use, please switch to manual state, so as to avoid accidents caused by long signal or other wrong actions. Disconnect the main power supply when not in use for a long time.
- 按电气设备的安装技术标准及设备容量配线。
  According to the installation technical standards of electrical equipment and equipment capacity wiring。
- 电气控制柜应良好接地，接地电阻应小于4欧姆，不可靠的接地将失去漏电保护作用。
  The electrical control cabinet should be well grounded, grounding resistance should be less than 4 ohms, unreliable grounding will lose leakage protection.
- 变频器输出端严禁接入改善功率因数的电容器，浪涌抑制器。
  The output end of the frequency converter shall not be connected to the capacitor to improve the power factor and the surge suppressor.
- 测量电机电气绝缘时，必须断开变频器与电机间的连线。
  When measuring the electrical insulation of the motor, the connection between the frequency converter and the motor must be disconnected.
- 超过415V的输入电压会损坏一些对电压敏感的电气部件。当供电电压超高时，需采取降压措施后才能使用本机器。
  Over 415V input voltage will damage some voltage-sensitive electrical components. When the power supply voltage is too high, the machine can only be used after taking the step-down measures.
- 经过专业训练的电气技术人员，有资格从事机器设备安装就位后的电气接线及日常维护和修理工作，非专业人员的盲目参与，可能会引发意想不到的事故，如电气元件的人为损坏、电气失控，造成机械损坏，人身伤亡等。
  Electrical technicians with professional training are qualified to be engaged in the electrical wiring and daily maintenance and repair work after the installation of machinery and equipment in place. Blind participation of non-professionals may cause unexpected accidents, such as man-made damage of electrical components, electrical out of control, mechanical damage, human casualties and so on.
- 在使用本机之前必须检查所有电气接线端有无松动现象，必要的时候需要将螺丝加固，以免开机造成事故。必须检查线路中有无短路现象。检查完毕确认无安全漏洞方可开机。
  Before using the machine, all electrical terminals must be checked for looseness, and screws

should be reinforced when necessary to avoid accidents caused by starting up. It is necessary to check whether there is a short circuit in the circuit. Check and confirm that there is no security hole before starting.

- 机器不用时，请切断电、气源，以保证安全。（**长时间断电请注意每隔5天给设备通电，以保证PLC的数据块不丢失**）
  When the machine is not in use, please cut off the power and air source to ensure safety.(please note that the power is switched on every 5 days after power failure for a long time to ensure that the data block of PLC is not lost)

3.6.4.7、常见故障及其解决办法 common failures and their solutions

- 切割动作完成后，发现管子没有切断。after the cutting action is completed, found that the pipe did not cut off.
  解决方法：1）查看刀片在进刀到位的时候能否穿透管材制品；
  2）适当的增加进刀时间。
  Solution: 1) to see if the blade can penetrate the pipe products when the knife is in place;
  2) Appropriate increase in the time of the knife.
- 管子切断后，发现大盘还在公转。the pipe cut off, found that the market is still in the rotation.
  解决方法：1）适当的减少进刀时间。
  Solution: 1) Reduce the time of incoming knife appropriately.
- 管子切断后，发现机台已经达到行程气缸的极限。the pipe cut off, found that the machine has reached the limit of the stroke cylinder.
  解决方法：1）查看是否是进刀时间过长。
  2）查看是否是进刀的进油速度太慢，如果是进刀的进油速度太慢，可以适当的提高，以便缩短整个切割流程时间。
  Solution: 1) Check to see if it is too long to enter the knife.
  2) Check whether the inlet speed is too slow to enter the knife, if the inlet speed of the inlet is too slow, can be appropriately improved, in order to shorten the entire cutting process time.
- 变频器故障 The inverter fault.
  解决方法：变频器操作面板出现报警代码的时候，请查看相应的变频器说明书，对照说明书上的解决办法来解决。
  Solution: When the alarm code appears in the Inverter operator panel, please check the corresponding，Frequency converter instructions, control the instructions on the solution to solve.
- 其他本文未提到的故障及问题，请咨询本公司的专业调试人员。
  This article did not mention the failure and problems, please consult the company's professional commissioning staff.

3.6.5、液压系统使用说明书 Instruction manual for hydraulic system

3.6.5.1、主要技术参数 main technical parameters

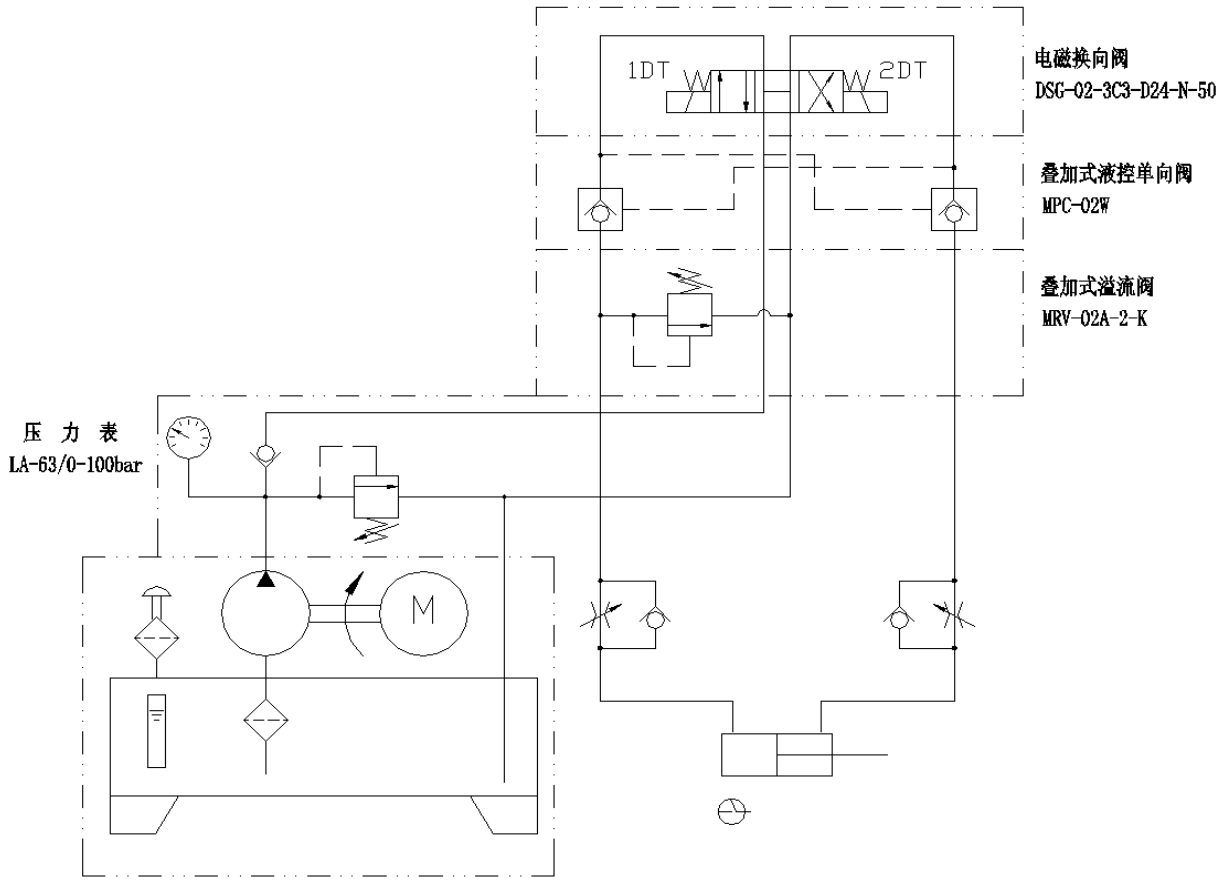
- 系统工作压力（P）：P系＝6 MPa ， P减＝4MPa（1 MPa = 10 公斤力/厘米2）
  system working pressure (P) : P series = 6 MPa, P minus = 4MPa (1 MPa = 10 kg force / 2 cm)
- 流量（Q） = 3.6 L/min flow rate (Q) = 3.6l /min
- 油箱加油量：8升 fuel capacity in the tank: 8 liters
- 电动机功率：0.55 KW motor power: 0.55kw
- 连接尺寸（机体螺纹）：ZG1/4”/ M16×1.5 ----- 扩口式端直通接头connecting

dimension (body thread) : zg1/4 "/ M16 1.5 ---- -flaring end straight joint

- 系统电压：三相AC380V　system voltage: three-phase AC380V
- 电磁换向阀控制电压：DC24V　control voltage of electromagnetic directional valve: DC24V
- 油液：ISO VG46号抗磨液压油　oil: ISO VG46 anti-wear hydraulic oil

3.6.5.2、液压系统工作原理及主要组件 working principle and main components of the hydraulic system

3.6.5.2.1、液压系统原理图 Hydraulic system schematic diagram



该液压系统由：泵组单元、控制阀块单元、油箱、油缸等四部分组成。
The hydraulic system is composed of four parts: pump unit, control valve block unit, fuel tank and oil cylinder.

3.6.5.2.2、主要组件 main components

- 电机泵组单元 motor pump unit
  - 电动机motor
    - 功率：0.75　KW　Power: 0.75kw
    - 转速：1450rpm　Speed: 1450 RPM
  - 齿轮泵Gear pump
    - 排量：2.5 ml/r　Displacement: 2.5ml /r
    - 最大压力（P max）：7 Mpa　Maximum pressure (P max) : 7 MPa

工作情况working conditions

电机带动油泵回转，在吸油区形成负压，油液在大气压作用下被吸入泵内，排出的油经电磁换向阀中位机能回油箱。
The motor drives the oil pump to rotate, forming negative pressure in the oil absorption area, and

the oil is sucked into the pump under the action of atmospheric pressure, and the discharged oil returns to the oil tank through the middle position of the electromagnetic directional valve.

此时系统无压力，电机空载运行。

At this time, the system has no pressure and the motor runs without load.

- 控制阀组单元 Control valve group unit

  采用叠加阀设计，体积小、重量轻、易于安装及维修（元件均采用进口台湾）Adopt the design of superposition valve, small size, light weight, easy to install and maintain (components are imported from Taiwan)

- 油缸伸出（可参照原理图进行）：Cylinder extension (refer to the schematic diagram) :

  当1DT电磁铁通电，电磁阀换向工作，压力油各经换向阀→进入油缸无杆腔推动活塞向外伸出，回油经电磁换向阀（T）回油箱，压力决定于阀块中的溢流阀P = 6 Mpa 。

  When the 1DT electromagnet is energized and the solenoid valve works in the reverse direction, the pressure oil enters into the rodless chamber of the oil cylinder and pushes the piston outward. The oil returns to the oil tank through the solenoid reversing valve (T), and the pressure is determined by the overflow valve P = 6mpa in the valve block.

- 油缸缩回：cylinder retraction:

  当2DT电磁铁通电，各油缸在不同工作情况下进行工作，与伸出类同。

  When the 2DT electromagnet is energized, each cylinder works under different working conditions, similar to stretching.

- 升降、顶紧油缸悬空：Lifting, lifting and suspending the jacking cylinder:

  油缸根据原理可伸出、缩回过程中悬空，只要在伸出、缩回过程中电磁铁断电，即产生悬空停止，此时油液被封闭于油缸活塞与电磁换向阀所形成的封闭空间内，形成保压锁紧状态。

The oil cylinder can be suspended in the process of extending and retracting according to the principle. As long as the electromagnet is cut off in the process of extending and retracting, the suspension stops. At this time, the oil is closed in the closed space formed by the piston of the oil cylinder and the electromagnetic directional valve, forming a pressure-maintaining and locking state.

3.6.5.3、液压系统操作程序 Operating procedures of the hydraulic system

3.6.5.3.1、开机前准备 preparation before starting

- 油位确定：液位油加至液位计高度的95%。
  Oil level determination: add the oil level to 95% of the height of the level gauge.
- 旋向确定：（电机点动）与刀的方向一致。
  Determination of rotation direction :(motor inching) consistent with the direction of the knife.

注：严禁缺油和反转运行，否则将造成油泵干烧损坏！

Note: it is strictly prohibited to run short of oil or invert, otherwise the oil pump will be damaged by dry burning.

3.6.5.3.2、系统参数调节 system parameter adjustmen

- 压力调节（插装式溢流阀）
  Pressure regulation (cartridge type relief valve)
- 顺时针压力升高，逆时针压力降低
  Clock wise pressure increases, counterclockwise pressure decreases
- 系统工作压力：P=6MPa　System working pressure: P=6MPa
- 出厂时压力已调节好，原则上不要调整，一定要调节时，请在充分理解原理的情况下调节！
  Factory pressure has been adjusted, in principle, do not adjust, must be adjusted, please fully

understand the principle of adjustment!

3.6.5.4、排除故障 exclude malfunction

故障状态 Fault condition	现　象 phenomenon	原因分析 The original analysis	排除方法 Elimination method
泵的噪声过大 The noise of the pump is too loud	泵中发生气穴 the pump hair angry hole	吸油阻力过大 吸油管径过小、弯曲过多引起局部压降大 吸油高度超高 油温过低 油液粘度过高 泵转速度过快 油液劣化起泡 Excessive oil absorption resistance too small diameter and too much bending of oil suction pipe cause local pressure drop Extremely high oil absorption The oil temperature is too low oil viscosity is too high pump speed is too fast oil deterioration foam	减小吸油阻力 增大吸油管径减少弯曲 减小吸油高度 加热油液 更换粘度小的油液 降低泵转速 更换油液 Reduce oil absorption resistance increase the oil suction pipe diameter，reduce the bending Reduce the oil absorption height Heat the oil Replace oil with low viscosity reduce the pump speed Replace the oil
	油液中混入空气 The oil mingled with air	吸油口接头漏气 液位不够 轴封处有空气吸入 oil suction port joint leakage Insufficient liquid level Air is inhaled at the shaft seal	拧紧接头、更换密封 增加液位 涂黄油检查 Tighten the joint and replace the seal Increase the liquid level Butter check
	机械振动 Mechanical vibration	同心度超差concentricity overshoot 泵、电机连接螺钉松动 pump, motor connection screw loose 泵本身机械故障，如：斜盘轴承、滑履损坏等 The pump itself mechanical fault, such as:Swash plate bearing damaged sliding shoes, etc	同心度小于0.1mm Concentricity is less than 0.1mm 拧紧松动螺钉 Tighten loose screws 修理或更换新泵 Repair or replace the pump

压力故障 Pressure failure	一、无压力、压力不足或调压不成比例 一.No pressure, insufficient pressure or disproportionate pressure regulation	电机反转 液位不够 吸油口漏气、未吸上油 油液中混入空气 压力阀故障 压力阀阀芯处有异物卡住 弹簧折断 泵、元件过度磨损、泄漏大 油液粘度过低 有其它卸荷通道 Motor reverse Insufficient liquid level The suction port leaks air and does not suck oil Air mixed in the oil Pressure valve failure There is a foreign body stuck in the pressure valve spool Broken spring Excessive wear and leakage of pumps and components The oil viscosity is too low There are other unloading channels	改变转向 增加液位 拧紧接头、更换密封 不让空气混入 清洗或更换压力阀 清除异物 更换弹簧 更换或修理 更换合适油液 查找并排除卸荷通道 Change direction Increase the liquid level Tighten the joint and replace the seal Do not let air in Clean or replace the pressure valve Remove foreign objects Replace the spring Replace or repair Replace with suitable oil Find and exclude unloading channels
	二、压力下不来 二. Not under pressure	阀芯卡死 卸荷通道被堵死 Spool stuck The unloading channel is blocked	清洗阀 让卸荷通道通畅 Cleaning valve Make the unloading channel unobstructed
流量故障 Flow failure	流量不足速度失控 Insufficient flow rate out of control	泵发生气穴 油液中混入空气 阀芯被异物卡死 元件过度磨损、间隙增大 Cavitation in the pump Air mixed in the oil The valve core is stuck by foreign matter Excessive wear of components and increased clearance	减小吸油阻力 防止油液中混入空气 清洗阀芯 修理或更换 Reduce oil absorption resistance Prevent air from being mixed into the oil Clean the spool Repair or replace
换向阀故障	换向后无动作No action	电信号故障 无控制信号输入	排除电信号故障 让控制信号输入

Reversing valve failure	after commutation	❙ 电磁铁插头接触不良 ❙ 电磁铁线圈烧坏 ❙ 电压不符、欠电压 ❙ 阀芯被异物卡死 ❙ 弹簧折断 ❙ 先导阀控制油路故障 ❙ Electrical signal failure ❙ No control signal input ❙ Poor contact of solenoid plug ❙ The solenoid coil is burnt out ❙ Voltage mismatch, undervoltage ❙ The valve core is stuck by foreign matter ❙ Broken spring ❙ Pilot valve control circuit failure	❙ 使电磁铁插头接触良好 ❙ 更换电磁铁线圈 ❙ 输入正确电压 ❙ 清洗阀芯 ❙ 更换弹簧 ❙ 排除先导阀控制油路故障 ❙ Eliminate electrical signal failure ❙ Let control signal input ❙ Make good contact with the solenoid plug ❙ Replace the solenoid coil ❙ Input the correct voltage ❙ Clean the spool ❙ Replace the spring ❙ Troubleshoot pilot valve control oil circuit failure
锁紧保压故障 Lock and hold pressure failure	油缸不能锁紧The cylinder cannot be locked	❙ 液控单向阀控制活塞卡死 ❙ 主阀芯锥面泄漏 ❙ Hydraulic control check valve control piston stuck ❙ Cone leakage of main spool	❙ 清洗控制活塞 ❙ 更换主阀芯 ❙ Clean the control piston ❙ Replace the main spool

❙ 对液压系统的油温、清洁度、噪音进行定期检查。
Oil temperature, cleanliness, noise of the hydraulic system for regular inspection.

Ø 如油温过高或噪音大，检查液压油是否太少,造成油泵吸空，需加油。
If the oil temperature is too high or the noise is too high, check whether the hydraulic oil is too little, causing the oil pump to suck empty, so it needs to be refueled.

Ø 油泵是否因使用时间太久，应更换油泵。
Whether the oil pump has been used for too long, it should be replaced.

液压油污染严重，出现恶臭变质现象，应更换液压油。在新设备运行100小时后，更换新液压油。以后一年(约3000工作小时)更换一次，液压油建议采用粘度为25～40cst的耐磨液压油、透油等。

Hydraulic oil pollution is serious, malodorous deterioration phenomenon, should be replaced hydraulic oil. Replace the new hydraulic oil after running the new equipment for 100 hours. After one year (about 3000 working hours), the hydraulic oil is recommended to use 25 ~ 40cst viscosity of wear-resistant hydraulic oil, through the oil.

❙ 检查液压站上阀组和管接头是否有漏油现象，应更换密封。
Check the hydraulic station valve group and pipe joint whether there is oil leakage phenomenon, should replace the seal.

- 电磁换向阀换向效果是否正常、单向节流阀调节速度是否有效、溢流阀调节系统压力是否有效， 如出现异常，应检修或更换液压元件。
  Whether the electromagnetic directional valve reversing effect is normal, one-way throttle valve regulating speed is effective, overflow valve regulating system pressure is effective, if there is an exception, maintenance or replacement of hydraulic components.
- 各种滤芯应每半年更换一次。清理气动三联件上的过滤器，并换上新油。
  All kinds of filter elements should be replaced every six months.Clean the filter on the pneumatic triad and replace with new oil.

3.6.6、故障与排除(详见下表) Failure and troubleshooting (see the table below for details)

现象 Phenomenon	原因 reason	排除方法 Exclusion method
无油压 No oil pressure	- 电机反转 Motor reverse - 压力表损坏 Damage of pressure gauge - 油路堵塞 Road blockage - 缺油 Oil deficiency	- 电机换向 Motor Commutative - 换压力表 Pressure change gauge - 清理油路 Cleaning the oil road - 加油 To refuel
无进退刀动作 No advance and retreat knife movement	- 油压太低 The oil pressure is too low - 电磁阀故障无动作 No action for solenoid valve fault	- 调节溢流阀 Adjust the overflow valve - 检查电磁阀 Check the solenoid valve
切不断 Cut constantly	- 公转记数值太小 The revolution value is too small - 进刀量不够 Insufficient feed	- 记数值增大 Increase the value - 调整限位螺丝 Adjust limit screws
切割端面错位	锯台前进速度与牵引速度不同步	调节气缸节流阀
无记长 Unrecorded length	- 倍率校准值为0 The calibration value of the multiplier is 0 - 编码器坏 Encoder breaken	- 重新设定为1 Reset to 1 - 更换编码器 Change the encoder
切割.进刀电机转动困难 Cutting. Feeding motor rotation is difficult	- 电机缺相 Motor phase is missing - 电刷打火 Brush ignition	- 检查电机 Check the motor - 更换电刷 Replace the brush
锯台碰行程开关 Table saw contact stroke switch	- 公转速度太慢 The revolution speed is too slow	- 增加变频器频率 Increase frequency of frequency converter1. Increase frequency of converter

	▌旋转角度过大 Excessive rotation Angle	▌减小公转记数 Reduce the number of revolution
切割时大转盘不停 The rotary table does not stop when cutting	▌光电开关回路问题 Photoelectric switch circuit problem ▌光电开关感应不到 Photoelectric switch cannot sense	▌检查或更换 Check or replace ▌调整光电开关位置 Adjust the position of the photoelectric switch
切割完毕不退刀 Do not return the knife after cutting	▌液压油太小 The hydraulic oil is too small ▌油路堵塞 Blocked oil lines ▌电磁阀故障 Solenoid valve fault	▌液压油包加油 Oil the hydraulic oil tank ▌清理油路 Clean up the oil road ▌检查电磁阀 Check the solenoid valve

3.6.7、保养和维修 Maintenance and Repair

3.6.7.1、清理切割机 Clean up the cutting machine

在进行检查和清洁之前，必须切断有关切割机的全部电源。

Before carrying on the inspection and the cleaning, must cut off the related cutting machine the entire power supply.

当切割机正常工作一段时后,就应该切割机进行检查和清洁,若有故障则要根据实际情况决定维修或更换。

When the cutting machine works normally for a period of time, it should be inspected and cleaned. If there is a fault, it should be repaired or replaced according to the actual situation.

定期对行走导轨进行清洗及除锈，上防锈油，保护导轨，使整机行走轻松，无卡死现象。

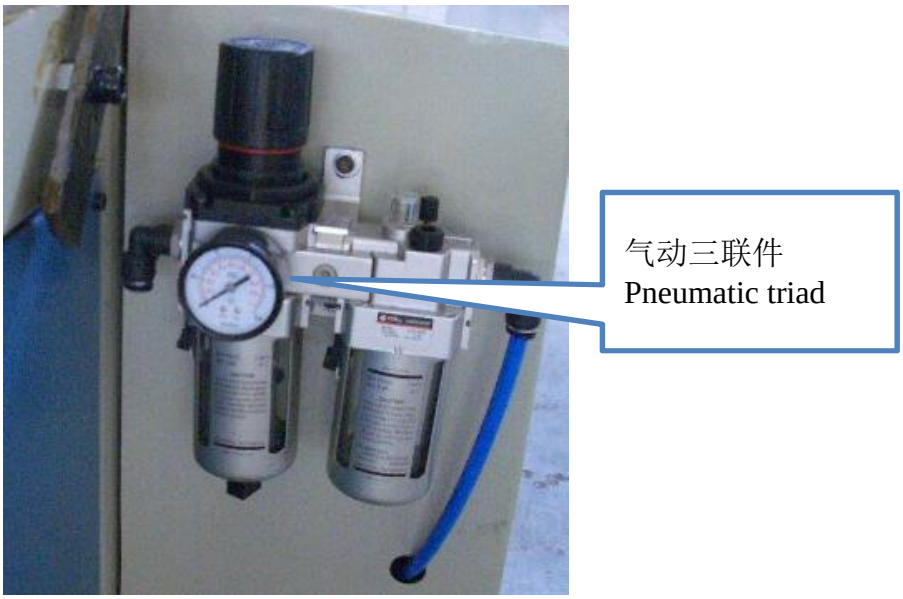
Regularly walking guide for cleaning and rust removing, rust-proof oil, protect the guide rail, so the walk easily, no stuck phenomenon.

3.6.7.2、每日维护 Daily maintenance

每天清除气动三联件内分离出的水，如不及时清理将有水进入气缸和阀。会使其内部生锈而造成频繁故障。油雾器不能断油，保证气动元件内的润滑，同样是为了减少故

障。

Remove the separated water in the pneumatic triplets every day. If it is not cleaned in time, water will enter the cylinder and valve. Will cause its internal rust and cause frequent failure. Oil mist device can not break the oil, ensure the lubrication of pneumatic components, and also to reduce the failure.



3.6.7.3、每月维修 Monthly maintenance

- 清洁机器。Clean the machine.
- 检查电器开关、按钮、导电碳刷是否定好，如有损伤，立即维修，导电碳刷如果磨损很多要予更换。
  Check electrical switches, buttons, conductive carbon brush is negative, if there is damage, immediately repair, conductive carbon brush if a lot of wear to be replaced.

- 检查硬度合金刀片有否损伤，重新刃磨或更换。
  Check the hardness alloy blade for damage, and re-sharpening or replacement.
- 润滑：Lubrication:
  - 托轮内轴承已润滑、密封，无需再加。
    The inner bearing of the supporting wheel has been lubricated and sealed, no need to add.
  - 托轮调节螺纹和哈夫圈导向柱需润滑和清洁，每月一次。
    Adjusting thread and guide post of carrier wheel shall be lubricated and cleaned once a

month.

Ø 锯盘主轴上的轴承每年拆卸清洗一次充满润滑脂。
The bearing on the saw disc spindle is removed and cleaned once a year and filled with grease

Ø 定期检查并增加液压油包内所损耗的油，让液压油包内的油充满，防止因油位较低产生油泵内进气，使进刀不稳定。
Regularly check and increase the loss of oil in the hydraulic oil bag, so that the oil in the hydraulic oil bag is full, to prevent the low oil level to produce gas in the pump, so that the feed is not stable.

电气部分

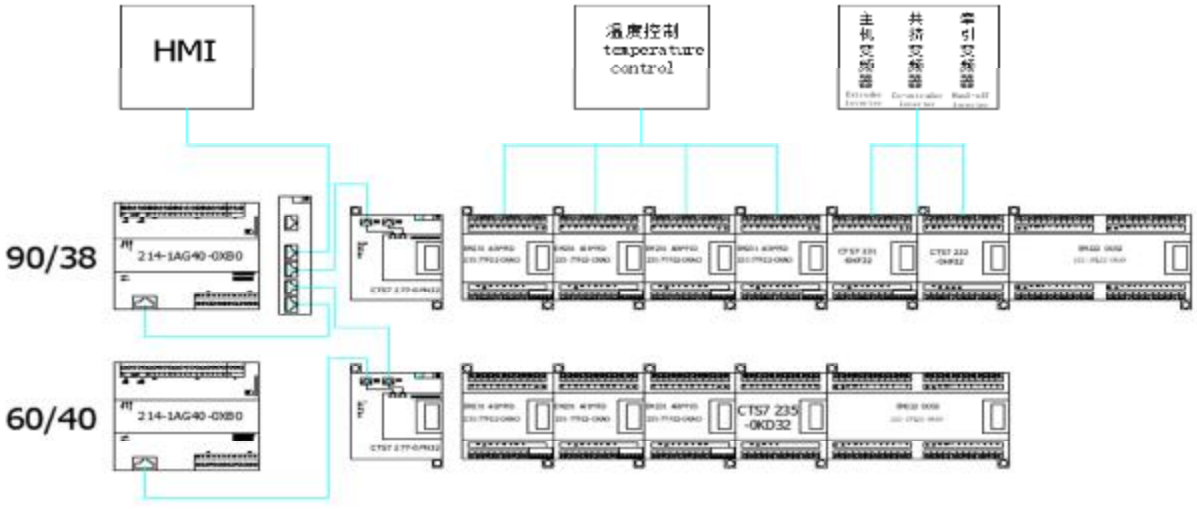
3.7、主机操作屏使用说明 Main unit operation screen instructions

3.7.1、90/38&60/40 电气配置 90/38&60/40 electrical configuration

本设备主要电气元件主要由以下部分构成 The main electrical components of this equipment are mainly composed of the following parts：

PLC：	西门子 S7 系列 Siemens S7 series
操作屏 Operation panel：	西门子触摸屏 Siemens Touch screen
文本显示器 Text display ：	西门子 TD400 或者西门子 7 寸触摸屏 Siemens TD400 or Siemens 7-inch touch screen
调速器 Governor ：	ABB or ETD
变频器 Inverter：	ABB or Bosch Rexroth orINOVANCE or JWELL
接触器 Contactor：	西门子或施耐德 Siemens or Schneider
中间继电器 Intermediate relay：	IDEC or Omron 和泉或欧姆龙
空气开关 air switch：	正泰、施耐德、LG 或西门子 CHNT,Schneider,LG or Siemens
变压器 transformer：	九川或天正 Jiuchuan or Tianzheng
开关电源 Switching power supply：	施耐德或欧姆龙 Schneider or Omron
压力传感器 Pressure Sensor：	成都先达 Xianda
按钮 Button：	APT 或施耐德 APT or Schneider

系统配置图如下 The system configuration diagram is as follows：



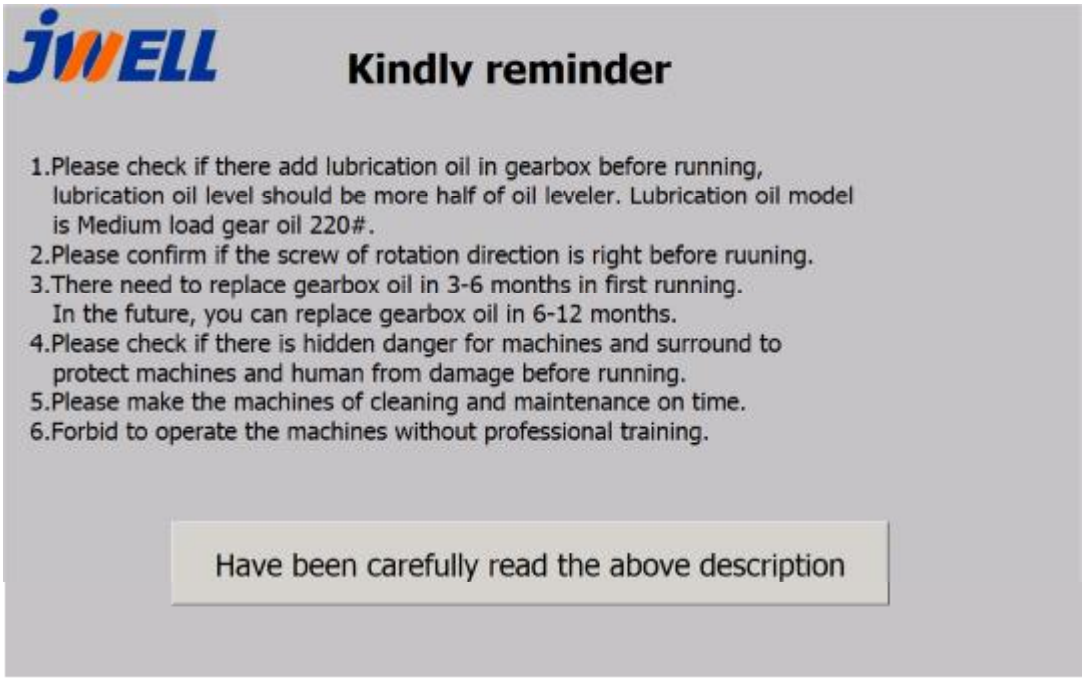
3.7.2、电脑屏操作 Computer screen operation

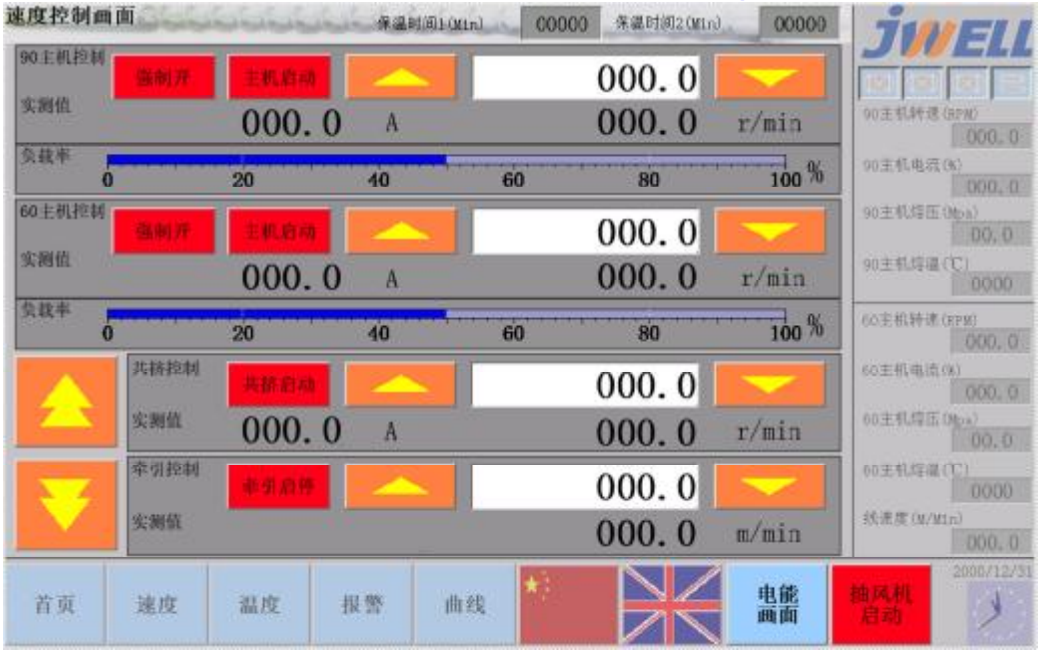
起始画面如下图，介绍设备类型、版本号 The initial screen is as shown in the figure below, which introduces the device type and version number.

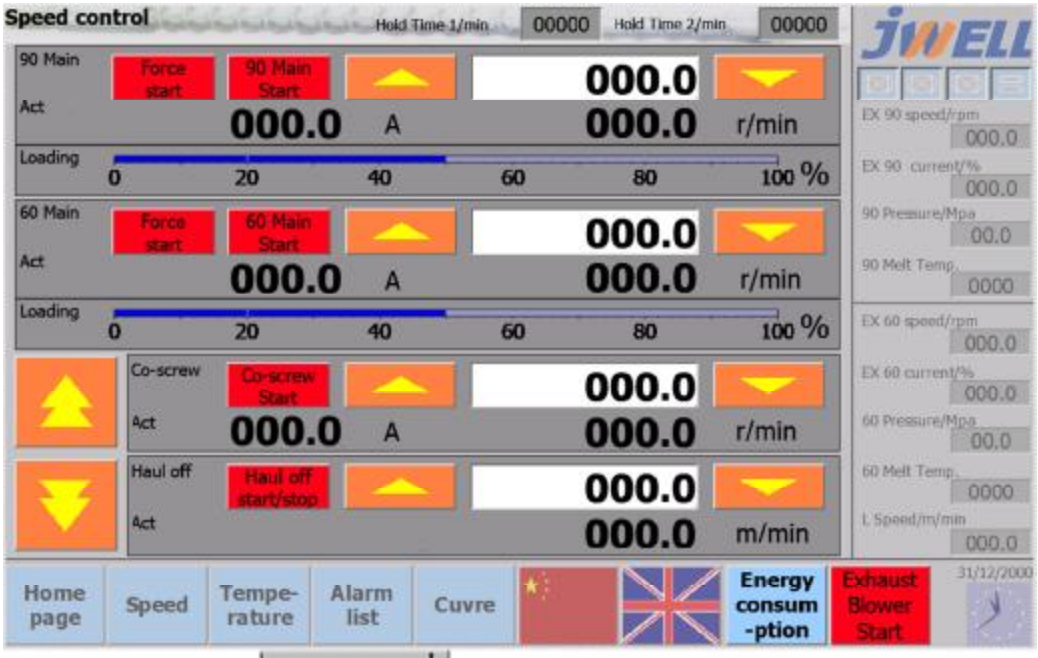
单击 进入系统 Entrance 默认进入温馨提示画面，按已认真阅读以上说明之后进入速度控制画面，以方便用户操作，画面最下方一排按钮为各画面之间的切换按钮。

Click 进入系统 Entrance by default to enter the warm reminder screen. After reading the above description carefully, enter the speed control screen to facilitate user operations. The

bottom row of buttons on the screen is the switch button between each screen.

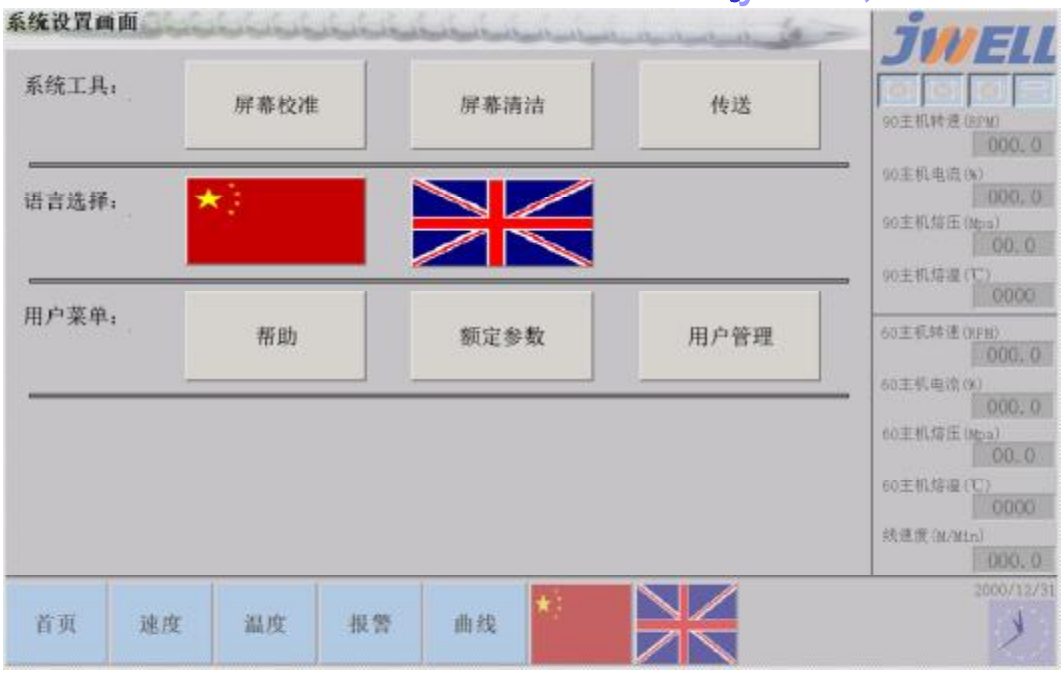


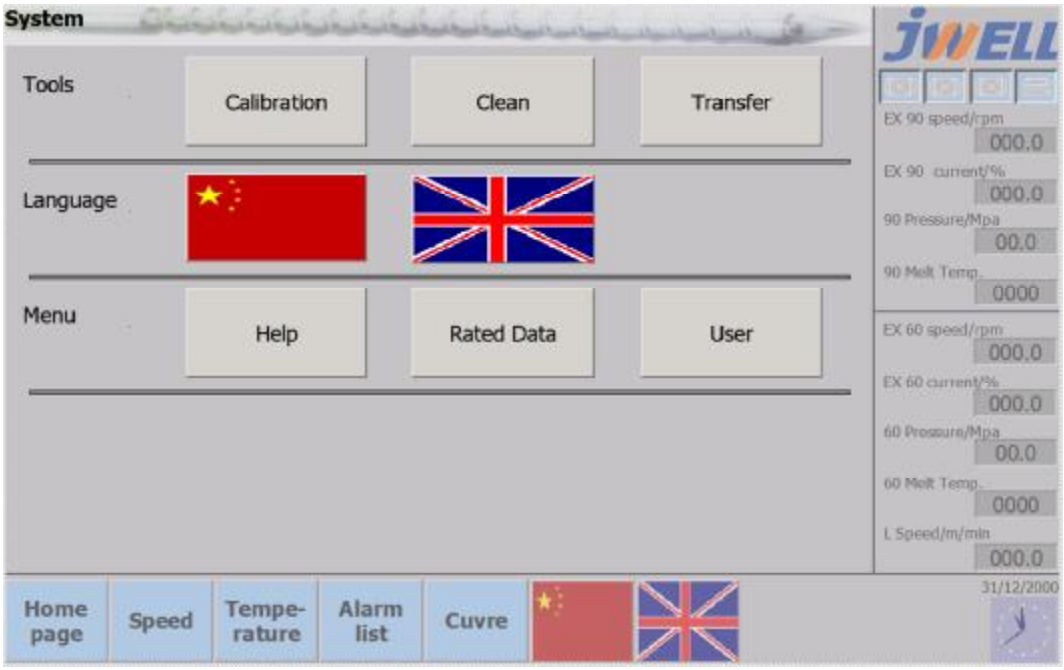




在起始画面，单击  进入系统设置画面如下

On the start screen, click  to enter the system setting screen as follows





在这里可以做以下设置 The following settings can be made here

1 校准屏幕：如果发现屏幕触摸点位置不准，请使用屏幕校准按钮，单击屏幕校准按钮后会出现屏幕校准画面，按步骤点击光标位置直到完成校准。

2 屏幕清洁：屏幕上灰尘比较多如需清洁，请使用屏幕清洁按钮，单击屏幕清洁按钮屏幕会锁定 30 秒，请将屏幕擦干净，30 秒后自动恢复到控制画面。

3 传送：屏幕切换到项目装载链接页面，是方便调试工程师做的专用按钮。

4 语言：屏幕语言有两种中文和英文，出厂默认中国为中文，其他国家为英文，使用者根据自身情况切换语言，  代表中文，  代表英文。

5 帮助：单击帮助按钮，可以查看系统帮助。

6 额定参数：**重要的数据，开机前必须准确设置**，进入额定参数需登录用户名和密码，出厂默认用户名为 123，初始密码为 300。

7 用户管理：更改管理员和用户的密码，进入用户管理需登录管理员用户名和密码，出厂默认用户名为 admin，初始密码为 0512。**警告：更改后要牢记，如忘记密码需返厂重置。**

1.Calibrate the screen: If you find that the position of the touch point on the screen is not accurate, please use the screen calibration button. After clicking the screen calibration button, the screen calibration screen will appear. Follow the steps to click the cursor position until the calibration is completed.

2.Screen cleaning: There is a lot of dust on the screen. If you need to clean it, please use the screen cleaning button. Click the screen cleaning button and the screen will be locked for 30 seconds. Please wipe the screen clean and it will automatically return to the control screen after 30 seconds.

3.Transfer: The screen switches to the project loading link page, which is a special button for debugging engineers.

4.Language: The screen language has two kinds of Chinese and English. The factory default is Chinese for China and English for other countries. Users can switch the language according to their own situation,  representing Chinese and  English.

5.Help: Click the help button to view the system help.

6.Rated parameters: important data, which must be set accurately before starting up. To enter the rated parameters, a user name and password must be logged in. The factory default user name is 123 and the initial password is 300.

7.User management: Change the password of the administrator and user. To enter the user management, you need to log in the administrator user name and password. The factory default user name is admin, and the initial password is 0512. Warning: Keep in mind after changing, if you forget the password, you need to return to the factory to reset.

在系统设置画面单击 

，或者在起始画面单击 

输入用户名和密码进入画面如下

Click 

on the system setting screen, or click 

on the start screen to enter the user name and password to enter the screen as follows

1 主机保温时间：此参数要根据实际生产使用的原料的料性以及设备的实际情况来设定，此参数不能过小，一定要保证机筒里的料熔化，否则主机启动会影响设备的使用效果及寿命。

2 额定转速：根据电机铭牌上的额定转速来设置

3 额定电流：根据电机铭牌上的额定电流来设置

4 其他参数根据实际情况来设置

1.Extruder holding time: This parameter should be set according to the material properties of the raw materials used in actual production and the actual situation of the equipment. This parameter cannot be too small. It must be ensured that the material in the barrel is melted, otherwise the start of the Extruder will affect the use of the equipment Effect and longevity.

2.Rated speed: set according to the rated speed on the motor nameplate

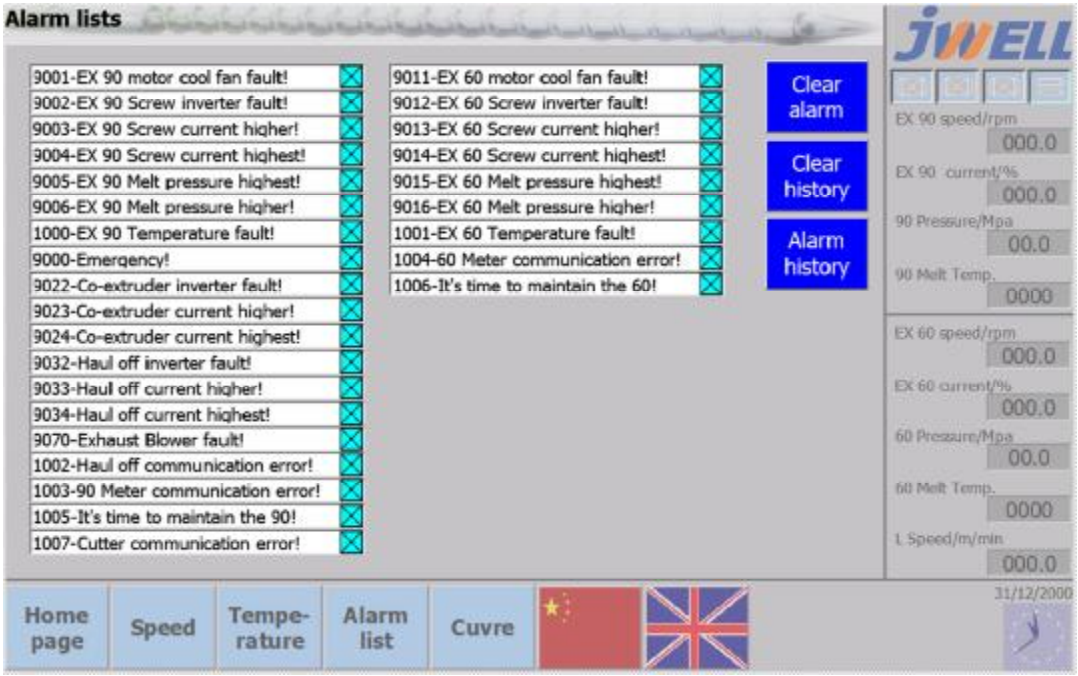
3.Rated current: set according to the rated current on the motor nameplate
4.Other parameters are set according to the actual situation
注意：该画面里的参数必须正确设置，否则会造成机器没法运行。
Note: The parameters in this screen must be set correctly, otherwise the machine will not run.

单击 

进入到报警画面如下

Click 

to enter the alarm screen as follows



1 报警：如有报警则“☒”会显示“⚠”，报警信息的底色会变成红色，文字变成白色，之后二者会交替闪烁，否则无报警。

2 报警清除：可以清除已经不存在的报警。如报警仍存在或有新报警，则仍会有报警显示。请根据提示找到故障原因并解决。

3 报警历史：可查看电脑屏运行时产生的所有报警。

4 清除历史：可清除所有报警信息。

单击 温度 Tempe-rature 进入到温度参数画面如下

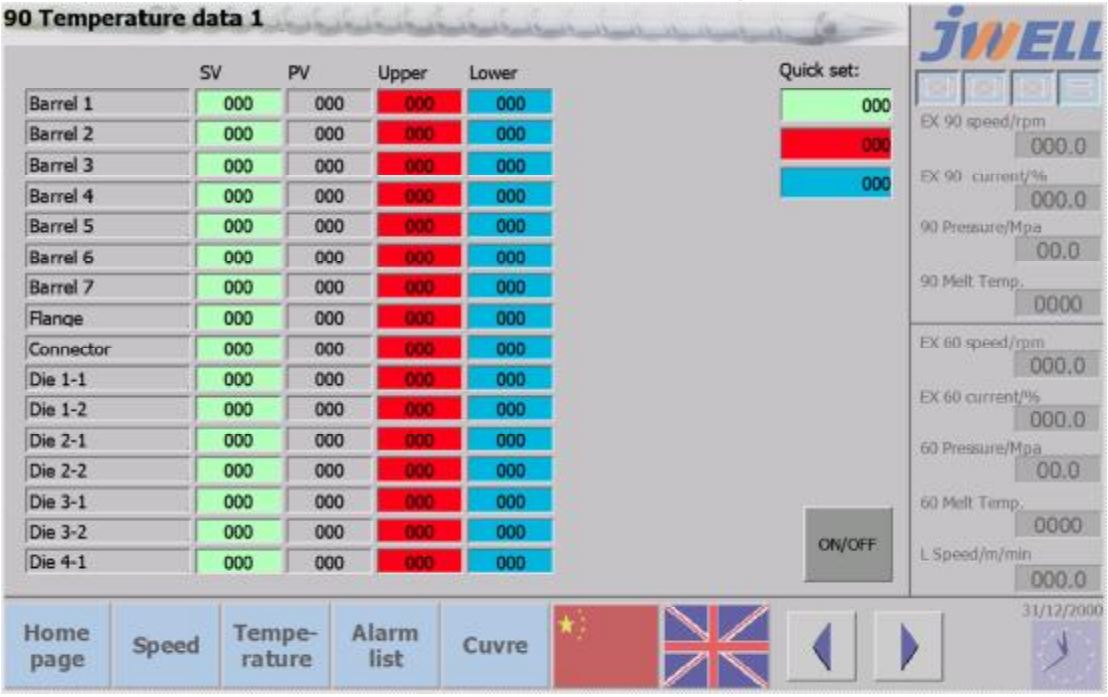
1 Alarm: If there is an alarm, "☒" will display "⚠", the background color of the alarm message will turn red, and the text will turn white, and then the two will flash alternately, otherwise there will be no alarm.

2Alarm clearing: you can clear the alarm that no longer exists. If the alarm still exists or there is a new alarm, there will still be an alarm display. Follow the prompts to find the cause of the fault and solve it.

3Alarm history: all alarms generated when the computer screen is running can be viewed.

4 Clear history: all alarm information can be cleared.

Click 温度 Tempe-rature to enter the temperature parameter screen as follows



1 快速设定：可以一次性对所有温控区的温度设定、温度上限、温度下限做快速设定。

2 设定：每一区都可单独设定温度设定、温度上限、温度下限及温度修正。

3 实测值：显示当前实际温度。

4 温度限制：当温度实际值超过上限温度时，实测值底色变为红色。当温度低于下限值时，实测值底色变为蓝色。

5 单击  和  进行上下页翻页。

1.Quick setting: The temperature setting, upper temperature limit, and lower temperature limit of all temperature control zones can be quickly set at one time.

2.Setting: Each zone can be individually set temperature setting, temperature upper limit, temperature lower limit and temperature correction.

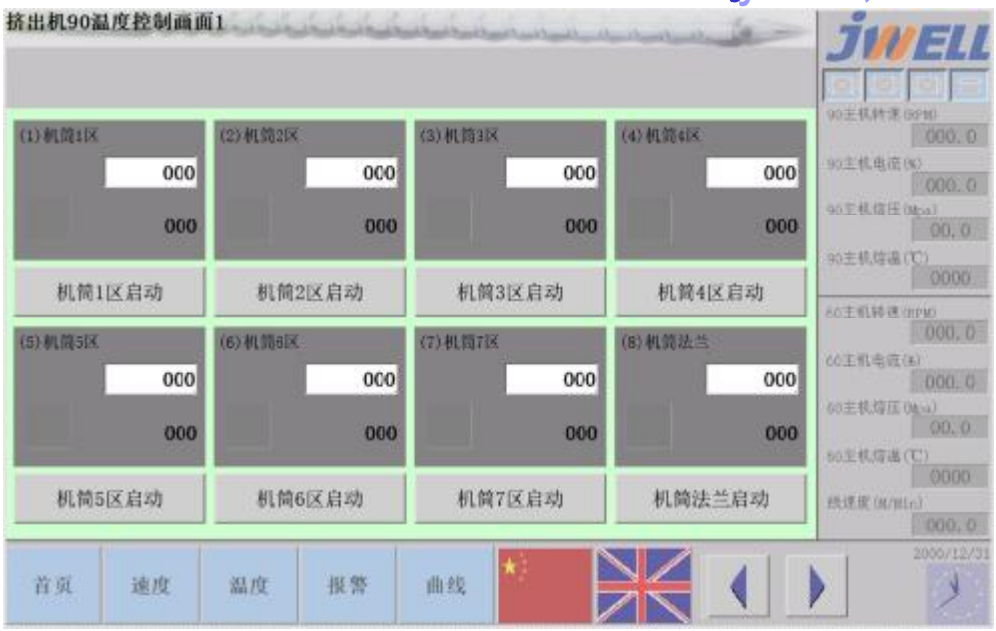
3.Actual measured value: display the current actual temperature.

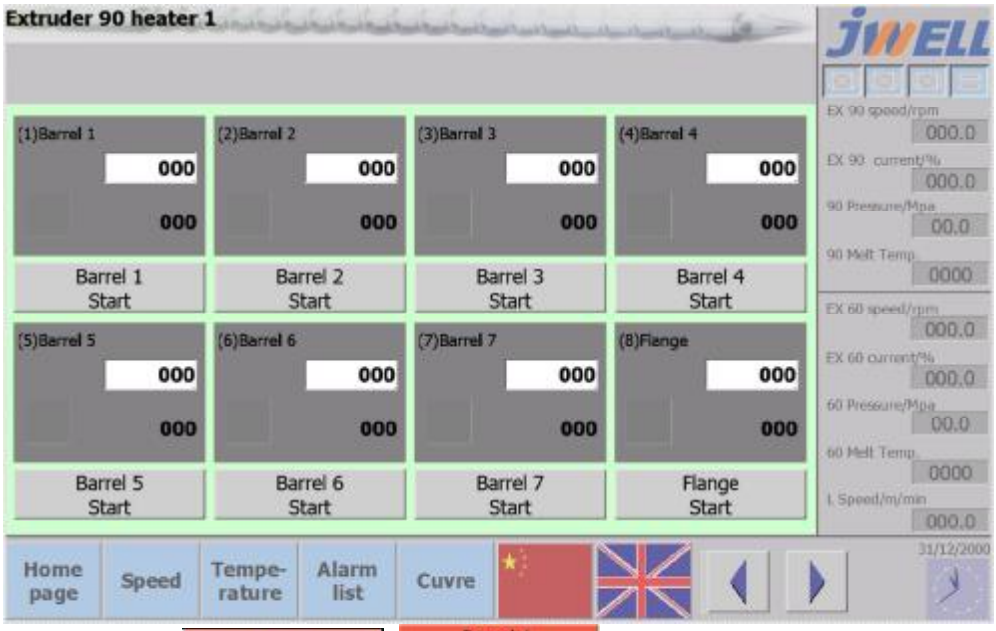
4.Temperature limit: When the actual temperature value exceeds the upper limit temperature, the background color of the actual value changes to red. When the temperature is lower than the lower limit, the background color of the measured value turns to blue.

5.Click  and  turn pages up and down.

单击  进入到温度控制画面如下

Click  to enter the temperature control screen as follows





1 启停开关： 

控制机筒一区加热冷却的启动和停止。

2 加热状态：  该区正在加热。

3 冷却状态：  该区正在冷却。

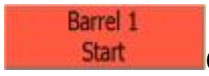
4 设定温度和实际温度： 

此区域为设定温度，可修改。

此区域为实际测量温度，不可修改。

5 单击  和  进行上下翻页。

1.Start-stop switch: 

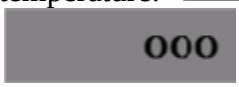


Control the start and stop of heating and cooling in a zone of the barrel.

2.Heating status: The area is heating.

3.Cooling status: The area is cooling.

4.Set temperature and actual temperature: 

This area is the set temperature and can be modified. 

This area is the actual measured temperature and cannot be modified.

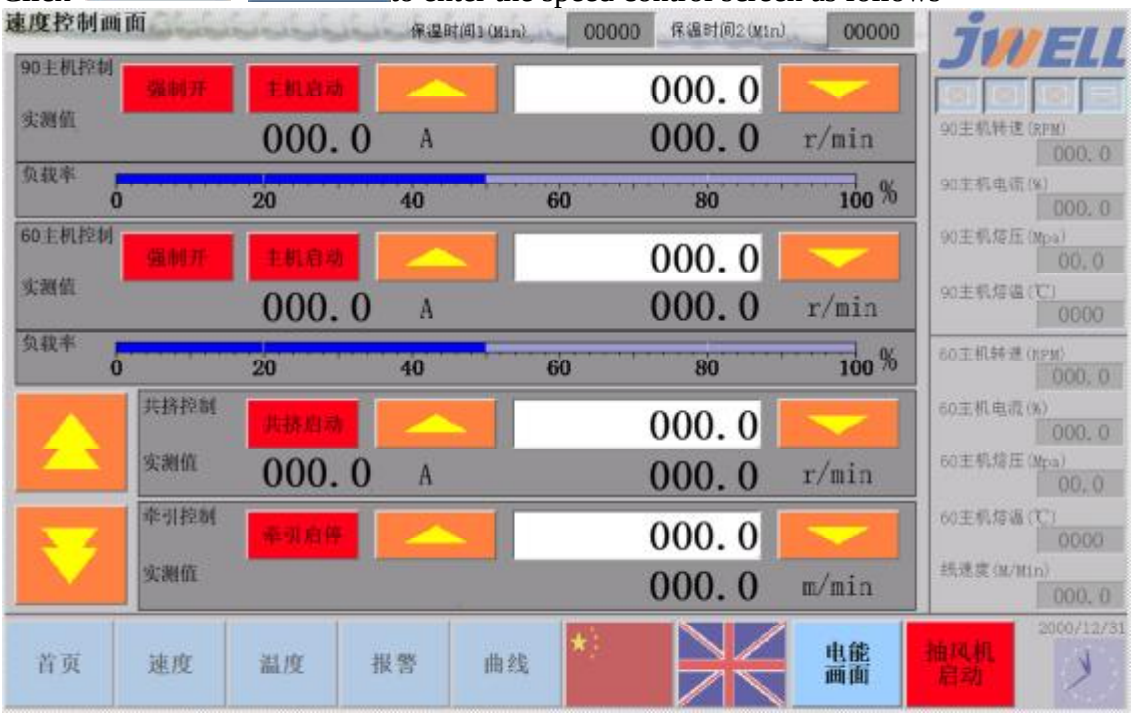
5.Click  and  to turn pages up and down.

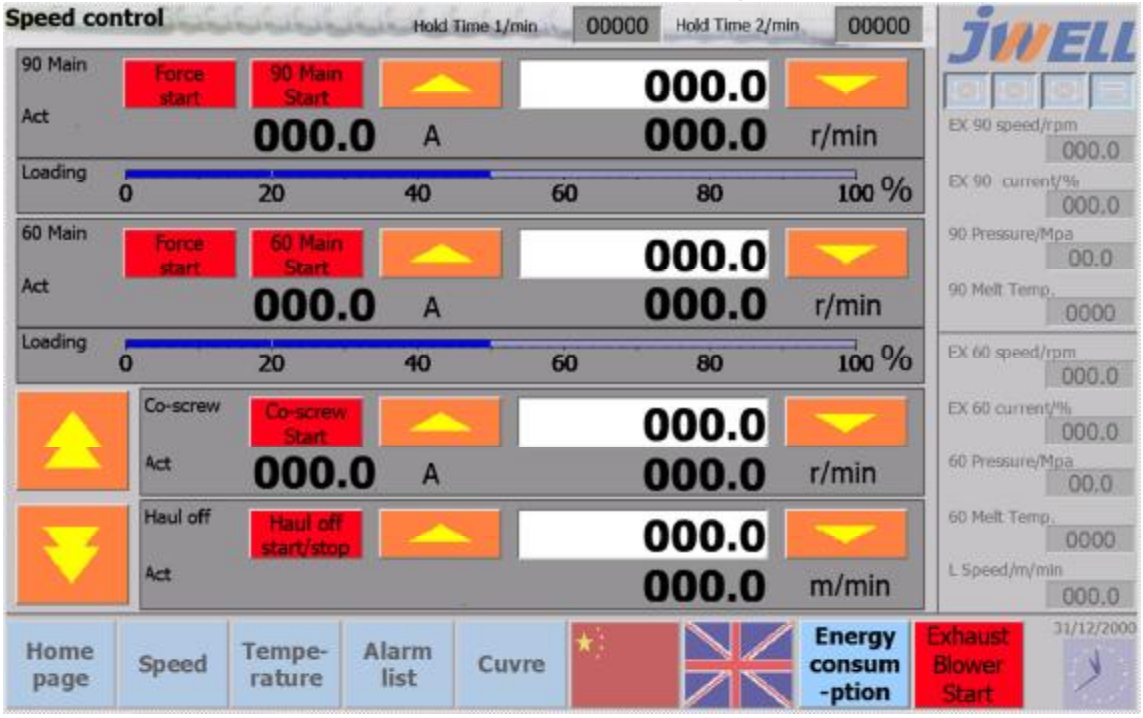
单击 

进入到速度控制画面如下

Click 

to enter the speed control screen as follows





1 启停：控制主机、共挤、牵引的启停操作。

2 速度：主机、共挤、牵引的转速可单独设定，可单独升速、降速，可同步升速、降速。

3 强制启动： 

在安装调试时使用，保温时间未到时短时间启动主机。**注意：正常开机时不允许使用以免引起设备损伤**

1.Start and stop: control the start and stop operations of the Extruder, co-extrusion and traction.

2.Speed: The speed of the main engine, co-extrusion, and traction can be set individually, and the speed can be increased and decreased independently, and the speed can be increased and decreased synchronously.

3.Forced start: 

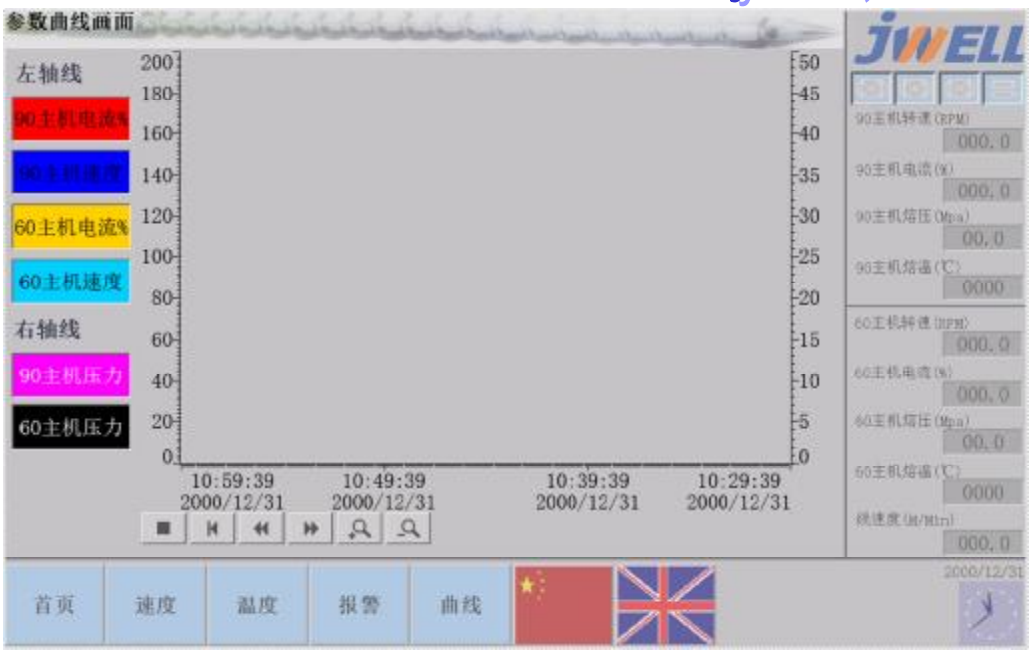
It is used during installation and debugging, and the Extruder is started for a short time when the holding time is not up. **Note: It is not allowed to use during normal startup to avoid damage to the equipment**

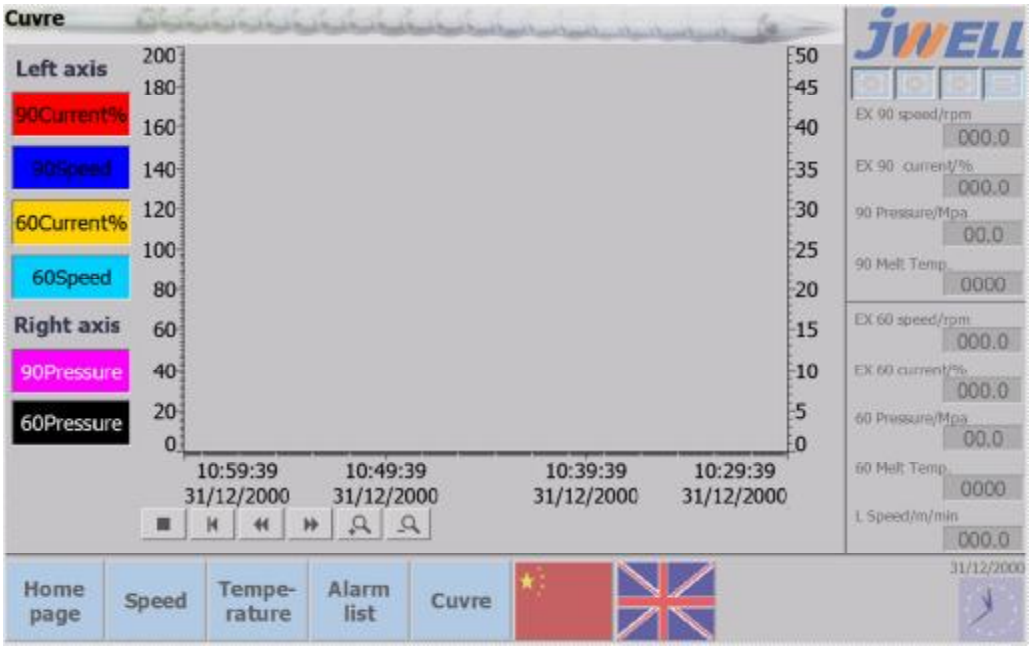
单击 

进入到曲线画面如下

Click 

to enter the curve screen as follows





在此画面中可以查看主机电流，主机速度，主机压力的实时曲线。

In this screen, you can view the real-time curve of Extruder current, Extruder speed, and Extruder pressure.

3.7.3、安装及注意事项 Installation and precautions

1、 按电气设备的安装技术标准及设备容量配线。
2、 电气控制柜应良好接地，接地电阻应小于 4 欧姆，不可靠的接地将失去漏电保护作用。
3、 直流调速器或变频器输出端严禁接入改善功率因数的电容器，浪涌抑制器。
4、 测量电机电气绝缘时，必须断开直流调速器、变频器与电机间的连线。
5、 超过 415V 的输入电压会损坏一些对电压敏感的电气部件。当供电电压超高时，需采取降压措施后才能使用本机器。
6、 经过专业训练的电气技术人员，有资格从事机器设备安装就位后的电气接线及日常维护和修理工作，非专业人员的盲目参与，可能会引发意想不到的事故，如电气元件的人为损坏、电气失控，造成机械损坏，人身伤亡等。

1. Wiring according to the installation technical standards and equipment capacity of electrical equipment.
2. The electrical control cabinet should be well grounded, and the grounding resistance should be less than 4 ohms. Unreliable grounding will lose the function of leakage protection.
3. It is strictly forbidden to connect the power factor-improving capacitor or surge suppressor to the output terminal of the DC speed regulator or inverter.
4. When measuring the electrical insulation of the motor, the connection between the DC speed controller, the inverter and the motor must be disconnected.
5. Input voltage exceeding 415V will damage some electrical components that are sensitive to voltage. When the power supply voltage is extremely high, you need to take measures to reduce the voltage before using this machine.
6. Professionally trained electrical technicians are qualified to engage in electrical wiring and daily maintenance and repair work after the installation of machinery and equipment. The blind participation of non-professionals may cause unexpected accidents, such as man-made damage to electrical components , Electrical out-of-control, causing mechanical damage, personal injury, etc.

机器不用时，请切断电源，以保证安全，长时间停机请注意每隔五天给设备通一下电，防止PLC数据丢失。

When the machine is not in use, please cut off the power supply to ensure safety. Please pay attention to power on the equipment every five days to prevent the loss of PLC data.

3.7.4、故障及报警 Faults and alarms

为了提高系统的可靠性，本控制系统具有智能故障诊断功能。当设备发生意外故障时将产生报警信号。报警等将不断闪烁，同时电脑屏上报警画面将显示报警内容。操作或维修人员将根据报警的内容提示进行故障的排除和恢复。下面将根据各种报警状况逐一进行说明In order to improve the reliability of the system, the control system has an intelligent fault diagnosis function. An alarm signal will be generated when the equipment fails unexpectedly. The alarm will continue to flash, and the alarm screen on the computer screen will display the alarm content. The operation or maintenance personnel will carry out troubleshooting and recovery according to the alarm content. The following will explain one by one according to various alarm conditions：

序号 NO	故障内容 Fault content	排除方法 Method of exclusion
1	主机调速器故障 Extruder governor failure	❙ 检查调速器面板上有无显示报警代码，如有则按报警代码查报警内容加以排除；如没有报警代码则检查调速器至PLC输入报警点信号有无，如有信号则PLC输入点的指示灯将亮； ❙ Check whether there is an alarm code displayed on the speed controller panel, if yes, check the alarm content according to the alarm code to eliminate; if there is no alarm code, check whether there is a signal from the speed controller to the PLC input alarm point, if there is a signal, the PLC input point The indicator light will light up;
2	主机冷却风机故障 Extruder cooling fan failure	❙ 检查冷却风机的热保护开关是否脱扣； ❙ 检查冷却风机是否坏； ❙ 检查冷却风机到PLC报警输入点信号有无，如有信号则PLC输入点的指示灯将亮； ❙ Check whether the thermal protection switch of the cooling fan has tripped; ❙ Check whether the cooling fan is broken; ❙ Check whether there is a signal from the cooling fan to the PLC alarm input point. If there is a signal, the indicator light of the PLC input point will be on;
3	主机电流超限制 Extruder current exceeds limit	❙ 检查电脑屏上主机电流限制值设置是否合理，应该大于电机额定电流； ❙ 检查负载是否过大； ❙ 检查调速器电流显示是否正常； ❙ Check whether the Extruder current limit value setting on the computer screen is reasonable, and it should be greater than the rated current of the motor; ❙ Check whether the load is too large; ❙ Check whether the current display of the governor is normal;

4	主机电流超极限 Extruder current exceeds limit	检查电脑屏上主机电流极限值设置是否合理，应该大于电流限制值； 检查负载是否过大； 检查调速器电流显示是否正常； Check whether the Extruder current limit value setting on the computer screen is reasonable, and it should be greater than the current limit value; Check whether the load is too large; Check whether the current display of the governor is normal;
5	共挤机调速器故障 Co-extrusion machine governor failure	参考主机调速器故障 Reference Extruder governor failure
6	熔体压力超限制或极限 Melt pressure exceeds limit or limit	检查电脑屏上压力限制值设置是否合理； 检查压力传感器接线是否正确； 检查压力传感器是否坏； Check whether the pressure limit setting on the computer screen is reasonable; Check whether the pressure sensor wiring is correct; Check whether the pressure sensor is broken;
7	牵引调速器故障 Traction governor failure	参考主机调速器故障 Reference Extruder governor failure
8	牵引电流超限制或超极限 Traction current exceeds limit or exceeds limit	参考主机超电流 Reference Extruder overcurrent
9	某区温度显示 32767 或 #####The temperature in a certain area displays 32767 or #####	检查热电偶是否坏或是否断线； 检查接线是否反向； 检查屏幕与PLC之间通讯线是否已连好 Check whether the thermocouple is broken or broken; Check if the wiring is reversed; Check whether the communication line between the screen and the PLC is well connected
10	某区温度无法控制 The temperature in a certain area cannot be controlled	检查该区测温线和加热线是否对应； 检查控制加热接触器是否有线路故障； 更换温控模块； Check whether the temperature measurement line and the heating line in the area correspond; Check whether there is a line fault in the control heating contactor; Replace the temperature control module;
11	主机不能启动 Extruder cannot start	检查是否有报警； 检查保温时间是否未到； 检查启动主机 Check if there is an alarm; Check whether the holding time has not expired; Check boot Extruder

四、附件 annex

附件一 • 用户告知书 **Attachment 1 User Notice**

SUZHOU • JWELL

专业挤出方案制定
Professional extrusion solution

用户告知书
User notification

服务热线Service Hotline：

售后负责After-sales responsibility	杨 勇	电话	15806225883
售后负责After-sales responsibility	李 强	电话	15806227298
技术支持Technical Support	高 奎	电话	15806222213
电气支持Electrical support	周 明	电话	15806227258

尊敬的用户Dear users：

您好！ Hello!

当您收到本告知书时，代表我们双方已正式进入合作阶段。本告知书主要使您了解我司针对您购买的设备所做的工作及发货、卸货、安装、调试、保养、培训等方面的相关情况。 为了能更好的合作，请您仔细阅读以下内容，如有疑问，请来电咨询。

When you receive this notice, it means that both of us have officially entered the stage of cooperation. This notice mainly enables you to understand the work done by our company for the equipment you have purchased and the relevant conditions of delivery, unloading, installation, debugging, maintenance, training, etc. In order to cooperate better, please read the following carefully. If you have any questions, please call us.

各注意事项介绍Introduction of each note

一、装卸货相关注意事项Precautions related to loading and unloading

提货注意Pay attention to delivery

当贵公司提货时，请提前付清余款后通知我司业务人员，并请作好发货委托函、提供驾驶员基本信息。 在装货前，请告知货车司机，我司需要对设备进行焊接固定，确保运输途中不出现移位造成设备损坏。 为了设备能安全到达， 请自行安排人员押车或跟车，我司不承担运输风险。

When your company picks up the goods, please pay the balance in advance and notify our business staff, and please prepare the delivery letter and provide the driver's basic information. Before loading, please inform the truck driver that our company needs to weld and fix the equipment to ensure that there is no displacement during transportation and damage to the equipment. In order for the equipment to arrive safely, please arrange personnel to escort or follow the vehicle by yourself, our company does not bear the transportation risk.

卸货注意Attention to unloading

卸货时，请贵司安排专业人员操作。注意设备的起吊点，并请根据设备铭牌上提示的重量，选择合适的吊具和卸货设备。

特别注意：挤出机起吊时，不可直接吊机筒位置。

When unloading, please arrange professional staff to operate. Pay attention to the lifting point of the equipment, and select the appropriate spreader and unloading equipment according to the weight indicated on the equipment nameplate.

Special attention: When lifting the extruder, do not directly lift the barrel position.

二、安装注意事项Installation Precautions：

人员要求Personnel requirements：

为确保设备能快速投入生产，我司会安排 1~2 名调试人员到贵司协助指导安装；请贵司至少安排 2~3 名机、电相关工作人员协助安装，并从中学习设备拆装、维修相关知识； 当设备安装完成后，我司调试人员会开机测试合同中约定的相应规格制品生产，请安排贵司的开机人员、电控管理人员等协助开机，并由我司调试人员对贵公司相关工作人员进行开机操作培训。

In order to ensure that the equipment can be put into production quickly, our company will

arrange 1~2 debugging personnel to your company to assist in the installation; please arrange at least 2~3 machine and electrical related staff to assist in the installation, and learn from the equipment disassembly and maintenance Relevant knowledge; When the equipment is installed, our commissioning personnel will start the production of products with the corresponding specifications agreed in the test contract. Please arrange for your company's start-up personnel, electronic control management personnel, etc. to assist in the start-up, and our commissioning personnel will check your company Relevant staff conduct boot operation training。

现场准备Site preparation：

厂房尺寸要求Plant size requirements：

生产线型号Model	厂房长度要求（米）Plant length requirements (m)	厂房高度要求（米）Plant height requirement (m)
PE(PPR)63/110高速线 PE(PPR)63/110 high-speed line	≥51（不含收卷Without winding）	≥5
PE(PPR)125/160高速线 PE(PPR)125/160 high-speed line	≥52（不含收卷Without winding）	≥5
PE(MPP)250/315高速线 PE(MPP)250/315 high-speed line	≥53	≥6
PE450高速线 PE450 high-speed line	≥56	≥6
PE630高速线 PE630 high-speed line	≥56	≥6
PVC32四出 PVC32 four out	≥23	≥4
PVC63双出 PVC63 double out	≥23（不含扩口Without belling）	≥4
PVC110双出 PVC110 double out	≥23（不含扩口Without belling）	≥4
PVC250/315线PVC250/315 line	≥32（不含扩口Without belling）	≥5
PVC400线PVC400 line	≥34（不含扩口Without belling）	≥6
PVC630线PVC630 line	≥40（不含扩口Without belling）	≥6

其余型号生产线或特殊定制生产线，请向我司索取相关数据。
For other production lines or special customized production lines, please ask for relevant data from our company.

起吊设备要求Lifting equipment requirements:：

生产线型号 Model	行车规格要求（吨） Driving specifications (tons)	生产线最重设备（吨） The heaviest equipment of the production line (tons)
PE(PPR)63/110高速线 PE(PPR)63/110 high-speed line	≥5	≥3
PE(PPR)125/160高速线 PE(PPR)125/160 high-speed line	≥5	≥3
PE(MPP)250/315高速线 PE(MPP)250/315 high-speed line	≥5	≥4
PE450高速线 PE450 high-speed line	≥10	≥9
PE630高速线 PE630 high-speed line	≥15	≥12
PVC32四出 PVC32 four out	≥5	≥3
PVC63双出 PVC63 double out	≥5	≥4
PVC110双出 PVC110 double out	≥5	≥4
PVC250/315线PVC250/315 line	≥5	≥5
PVC400线PVC400 line	≥10	≥8
PVC630线PVC630 line	≥15	≥12

其余型号生产线或特殊定制生产线，请向我司索取相关数据。
For other production lines or special customized production lines, please ask for relevant data from our company.

设备用水要求Equipment water requirements：
生产线进水Water in the production line
水压：≥0.3Mpa；水温：≤20℃（部分 PPR/PE 高速管线水温需≤20℃）； 进水管路：
Water pressure: ≥0.3Mpa; Water temperature: ≤20℃ (The water temperature of some PPR/PE high-speed pipelines needs to be ≤20℃); Water inlet pipeline:
110 以下生产线，进水管路≥DN40；
250/450 生产线，进水管路≥DN65；
630 以上生产线，进水管路≥DN80；
For production lines below 110, the inlet pipe ≥DN40;
250/450 production line, inlet pipe ≥DN65;
For production lines above 630, water inlet pipe ≥DN80;
生产线排水Production line drainage
110 以下生产线，排水管路≥DN125；
250/450 生产线，进水管路≥DN150；
630 以上生产线，进水管路≥DN200；
For production lines below 110, drainage pipeline ≥DN125;
250/450 production line, inlet pipe ≥DN150;
For production lines above 630, the inlet pipe ≥DN200;

供水水质要求Water quality requirements
设备冷却类（含机筒、减速箱、水冷型电机、油温机、工业水冷空调等）
Equipment cooling (including barrels, gearboxes, water-cooled motors, oil heaters, industrial water-cooled air conditioners, etc.)

PH值 PH	6.5-8.5	$CaCO_3$（mg/L）	≤150
氯离子（mg/L） Chloride ion (mg/L)	≤250	浑浊度Turbidity	≤3

制品冷却类（含真空箱、喷淋箱、浸泡箱、真空泵等）
Product cooling (including vacuum box, spray box, soaking box, vacuum pump, etc.)

PH值 PH	6.5-8.5	$CaCO_3$（mg/L）	≤300
氯离子（mg/L） Chloride ion (mg/L)	≤250	浑浊度Turbidity	≤10

设备用气要求Equipment gas requirements:：

压力范围（Mpa） Pressure range	0.5-0.7	含油量（mg/m^3） Oil content (mg/m^3)	≤300
固体粒子（μm）Solid particles (μm)	≤5		

设备用电要求Equipment power requirements：
请确保电源电压浮动范围：±5 %
请采购正规厂家的国标线缆，具体型号请向我司索取；
请根据我司提供的生产线总功率，选择合适的变压器；
请准备配电柜至我司主挤出机的线缆，生产线内部走线我司已配备；
当配电柜至挤出机电柜距离超过 50 米时，需要曾大线缆型号，防止线缆发热。
Please ensure that the power supply voltage floating range: ±5%
Please purchase the national standard cables of regular manufacturers, and the specific models can be obtained from our company;
Please select a suitable transformer according to the total power of the production line provided by our company;
Please prepare the cables from the power distribution cabinet to the main extruder of our company. The internal wiring of the production line has been equipped by our company;
When the distance between the power distribution cabinet and the extruder electrical cabinet exceeds 50 meters, the Zengda cable model is required to prevent the cable from heating.

三、生产线首次开机前注意事项Precautions before starting the production line for the first time

注意：开机前，请确保已经安排开机、电气人员陪同参与，并学习开机技巧。
Note: Before starting the machine, please make sure that you have arranged the start-up, accompanied by an electrician, and learn the starting skills.

水电气方面Water and electricity

- 请确保给/排水水路已经安装完毕，且已经经过测试无漏水情况；
  Please make sure that the water supply/drainage waterway has been installed and has been tested without water leakage;
- 请确保所有电路安装完毕，且要求接线牢固不易脱落；
  Please make sure that all circuits are installed and the wiring is required to be firm and not easy to fall off;
- 请确保所有有接地要求的地方已经接地；
  Please make sure that all places with grounding requirements are grounded;
- 请确保设备所有进气口已经连接，且进气气压在 0.5-0.7Mpa；
  Please make sure that all air inlets of the equipment have been connected, and the air inlet pressure is 0.5-0.7Mpa;

主挤出机、共挤机部分 Extruder, co-extruder part

- 请确保减速箱已经加油，具体牌号及加油量请参考附件二；
  Please make sure that the gearbox has been refueled, please refer to appendix 2 for the specific brand and refueling amount;
- 请确保挤出机主电机旋转方向准确（主电机联轴器或减速箱输出端有箭头标记）；
  Please make sure that the rotation direction of the main motor of the extruder is accurate (the output end of the main motor coupling or gearbox is marked with an arrow);
- 请确保挤出机机筒水套段进水气动控制可用；注意：开机加温时，请关闭该处球阀，等正式开机时再开启；
  Please ensure that the water inlet pneumatic control of the water jacket section of the extruder barrel is available; Note: When starting to heat up, please close the ball valve there, and then open it when it is officially started;

模具、定径 Mold & Sleeve

- 请确保所安装口模、芯棒、定径套规格与计划生产的制品规格一致；
  Please ensure that the specifications of the installed mold, mandrel, and sizing sleeve are consistent with the specifications of the planned product;
- 有水冷、油冷的模具，需要确保已经相应连接水冷及油冷组件；
  For water-cooled and oil-cooled molds, ensure that the water-cooled and oil-cooled components are connected accordingly;
- 请确保所有加热温控区已经与主电柜一一对应连接；
  Please ensure that all heating and temperature control areas have been connected to the main electrical cabinet one by one;

- 请确保所有瓷插头、热电偶及压力传感器已经正确牢固安装，避免出现接触不良导致损坏的情况出现；

Please ensure that all ceramic plugs, thermocouples and pressure sensors have been correctly and firmly installed to avoid damage caused by poor contact;

真空、喷淋部分 Vacuum, spray part

- 请确保尼龙托板规格安装准确，或尼龙托轮位置调节准确；

Please ensure that the specifications of the nylon pallet are installed accurately, or the position of the nylon supporting wheel is adjusted accurately;

- 请确保真空泵进水已经打开，且真空泵、水泵旋转方向正确；

Please make sure that the water inlet of the vacuum pump is turned on, and the rotation direction of the vacuum pump and water pump is correct;

- 请确保真空箱前后移动功能可用，底部固定底板已经配打膨胀螺钉；

Please make sure that the function of moving the vacuum box back and forth is available, and the bottom fixed bottom plate has been equipped with expansion screws;

- 请尽可能调节真空箱入口处定径套与口模芯棒同心；

Please adjust the sizing sleeve at the entrance of the vacuum box to be concentric with the mold core rod as much as possible;

牵引切割部分 Haul off & cutting part

- 请确保牵引机的压紧、松开及上下电动功能已经测试且可用；

Please make sure that the compression, release and up and down electric functions of the haul off have been tested and available;

- 请确保牵引机气缸气压已经调整，正常情况正压 0.5~0.7Mpa，薄壁管时降低正压，同时可打开背压，避免制品被压扁；

Please make sure that the air pressure of the haul off cylinder has been adjusted. Normally, the positive pressure is 0.5~0.7Mpa. In the case of thin-walled pipes, the positive pressure can be reduced, and the back pressure can be opened at the same time to prevent the product from being flattened;

- 请确保牵引臂压紧放松时，两头同步；如不同步，请调整两侧气缸上的单向节流阀；

Please ensure that the two ends are synchronized when the towing arm is compressed and loosened; if not, please adjust the one-way throttle valves on the cylinders on both sides;

- 请确保牵引机、切割机的起始位已经调整完毕，且牵引方向、切割旋转方向均正确；

Please make sure that the starting position of the haul off and cutting machine has been adjusted, and the direction of traction and cutting rotation are correct;

- 请确保切割机的随动、压紧气压合适；特别注意，切割机完成切割动作后回程速度不可太快，避免撞击机架；

Please ensure that the follow-up and compression air pressure of the cutting machine are appropriate; pay special attention to the return speed of the cutting machine after the cutting action is completed, so as not to hit the frame;

其他特别强调部分Other special emphasis part

- 检查整线活动部位在运输安装过程中是否有松动
  Check whether the movable parts of the whole line are loose during transportation and installation
- 检查锥双主机机筒与分配箱连接的大螺帽是否有松动
  Check whether the large nut connecting the cone double main engine barrel and the distribution box is loose
- 检查锥双螺杆与分配轴连接处花键套是否到位
  Check whether the spline sleeve at the connection between the conical twin screw and the distribution shaft is in place
- 检查喂料机是否有损害机器异物，并与主机脱开转动，辨别转向是否正确，是否有异物掉入喂料机
  Check whether the feeder has any foreign matter that damages the machine, and disconnect it from the main engine to determine whether the direction of rotation is correct, and whether foreign matter has fallen into the feeder
- 检查主机下料口是否有掉入异物
  Check whether there is any foreign matter falling into the feeding port of the extruder
- 检查主机螺杆运转方向是否正确
  Check whether the screw direction of the main engine is correct
- 检查真空箱和喷淋箱易漏地方是否漏水
  Check whether the vacuum tank and cooling tank are leaky places for water leakage
- 检查切割机试切样品管是否一切正常
  Check whether everything is normal when the cutter tries to cut the sample pipe

以上内容在首次开机前必须依次检查，确保开机顺利。
The above content must be checked in sequence before the first boot to ensure that the boot is smooth.

附件二 • 车间常用设备及工具清单

Annex II·List of common equipment and tools in workshop

序号 No	名称 Equipment	型号 Model	备注 Remark
1	内六角扳手 Allen wrench	1.5-19	
2	开口扳手 Open-end wrench	7-65	
3	套筒扳手 Socket wrench		
4	十字螺丝刀Phillips screwdriver		
5	一字螺丝刀Slotted screwdriver		
6	铜棒Copper rod		
7	挂钩/吊Hook/Sling		根据设备重量购买Purchase according to equipment weight
8	黄油butter		
9	加油枪Fuel gun		
10	硅油清洁Silicone oil cleaner		
11	游标卡尺 Vernier caliper		根据设备型号购买Purchase according to device model
12	深度尺Depth Gauges		
13	卷尺tape measure	3M/5M/7M	
14	塞尺Feeler gauge		
15	水平尺Spirit level		
16	手持式气枪Handheld air gun		
17	电锯Chainsaw		
18	气管trachea	8mm/10mm /12mm	根据设备匹配According to equipment
19	气管直通/三通Tracheal straight/three-way		
20	电工套装Electrician set		
21	万用表multimeter		
22	电钻（工业用）Electric drill (industrial use)		
23	角磨机Angle Grinder		
24	内磨机Internal grinding machine		
25	管钳Pipe wrenches		
26	老虎钳Vise		

27	红外线测温枪Infrared thermometer		
28	红外线水平仪Infrared level		
29	电焊机Welding machine		
30	加力杆Afterburner		
31	铜铲Copper Shovel		
32	LED手电筒LED flashlight		

附件三・各类挤出机及恒温油箱加油数据

Attachment 3 Refueling data of various extruders and constant temperature fuel tanks

减速箱用油数据（Lubricants for gear box of extruder）

型号 Model	加油量/每台 Oil quantity/Each	用油型号 The Oil Moedl	用途 Application
ZLYJ-173(中国Chinese brand)	10KG/12L	*L-CKC/D220-中国; *Mobil-600XP220; *Shell-Macom oil R220; *Galtex-Meropa220; *BP-Energol GRXP220; *Brand -ISO VG220; *Castrol-Alpha-sp220; *Castrol-Optigear-BM220; *Total-Carter-EP220;	单螺杆挤出机 single screw extruder
ZLYJ-225(中国Chinese brand)	50KG/59L		
ZLYJ-280(中国Chinese brand)	80KG/94L		
ZLYJ-315(中国Chinese brand)	90KG/106L		
ZLYJ-375(中国Chinese brand)	105KG/124L		
ZLYJ-420(中国Chinese brand)	170KG/200L		
ZLYJ-450(中国Chinese brand)	250KG/294L		
M114（福克FALK）	21KG/25L		
M115（福克FALK）	25KG/29L		
M117（福克FALK）	41KG/48L		
SZ-55(中国Chinese brand)	100KG/118L		锥形双螺杆挤出机 Conical twin-screw extruder
SZ-65(中国Chinese brand)	130KG/153L		
SZ-80(中国Chinese brand)	190KG/224L		
SZ-92(中国Chinese brand)	360KG/424L		
注意事项：Notice：			
初次使用300小时后需更换润滑油，之后每3000小时换油一次，至少保证6个月更换一次。 The oil needs to be changed after 300 hours of initial use,after that,change it once in 3000 hours,At least once every 6 mouths.			

恒温装置用油数据(thermostat)

型号 Model	加油量/每台 Oil quantity/Each	用油型号 The Oil Moedl	用途 Application
SJLC-1	25KG	*中国昆仑-320 *Mobil Therm-603/605 *Shell Thermia-B	55锥双挤出机 Conical twin-screw extruder 55
SJLC-2	25KG		65锥双挤出机 Conical twin-screw extruder 65
SJLC-3	25KG		80/92/110锥双挤出机 Conical twin-screw extruder 80/92/110
注意事项：Notice：			
请在正常运行6个月后，更换油封和导热油。 Please replace oil seal and heat conducting oil after 6 months of normal operation.			

附件四 • 生产线工艺记录卡

Annex IV·Production line process record card

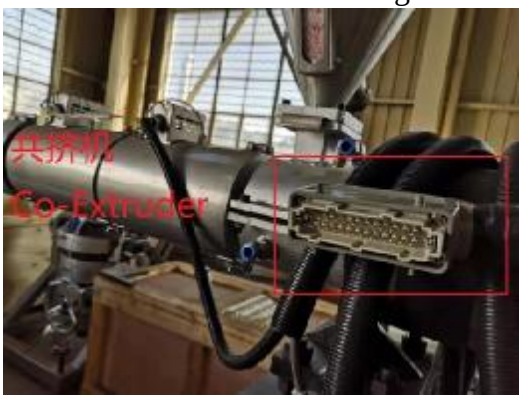
生产线工艺记录卡							
公司名称				开工令			
生产线规格				调试人员			
制品规格				制品执行标准			
原料牌号/配方				生产时间			
主机1产量 kg/h		冷却水温 ℃		模具出口间隙 上部	mm		
主机1能耗 kw.h/H		真空箱水温 ℃		模具出口间隙 下部	mm		
主机1转速 r/min		制品出真空箱温度 ℃		模具出口间隙 左部	mm		
主机1负载 %		制品出喷淋箱1温度 ℃		模具出口间隙 右部	mm		
主机1熔温 ℃		制品出喷淋箱2温度 ℃		口模与定径套距离	mm		
主机1熔压 Mpa		制品出喷淋箱3温度 ℃					
		制品出真空箱外径 mm					
主机2产量 kg/h		制品出喷淋箱1外径 mm		牵引机速度 m/min			
主机2能耗 kw.h/H		制品出喷淋箱2外径 mm		牵引机负载 %			
主机2转速 r/min		制品出喷淋箱3外径 mm					
主机2负载 %		下线后温度 ℃					
主机2熔温 ℃		下线后外径*壁厚 mm					
主机2熔压 Mpa		切割动作时间 S					
挤出机参数				模具温度设定 ℃			
挤出机1		挤出机2		区		区	
功率		功率		区		区	
速比		速比		区		区	
挤出率		挤出率		区		区	
吨能耗		吨能耗		区		区	
干燥温度设定		干燥温度设定		区		区	
吸料时间		吸料时间		区		区	
滤网清理时间		滤网清理时间		区		区	
机筒1区温度		机筒1区温度		区		区	
机筒2区温度		机筒2区温度		区		区	
机筒3区温度		机筒3区温度		区		区	
机筒4区温度		机筒4区温度		区		区	
机筒5区温度		机筒5区温度		区		区	
机筒6区温度		机筒6区温度		区		区	
机筒7区温度		机筒7区温度		区		区	
法兰温度		法兰温度		区		区	
改进意见：							

Production line process record card					
Comapny		Start order			
Size		testing staff			
Size of product		Product implementation standards			
Raw material grade/formulation		Production time			
Extruder 1 output kg/h		Cooling water temperature ℃		mold exit clearance upper	mm
Extruder 1 energy consumption kw.h/H		Water temperature of vacuum box ℃		Mold exit clearance bottom	mm
Extruder 1 speed r/min		Product temperature out of vacuum box ℃		Mold exit clearance left	mm
Extruder 1 load%		Temperature of product out of spray box 1 ℃		Mold exit clearance, right	mm
Extruder 1 melting temperature ℃		Product exit spray box 2 temperature ℃		Distance between mold and sizing sleeve	mm
Extruder 1 melting pressure Mpa		Temperature of product out of spray box 3 ℃			
		Outer diameter of vacuum box mm			
Extruder 2 output kg/h		Outer diameter of spray box 1 mm		Traction machine speed m/min	
Extruder 2 energy consumption kw.h/H		Outer diameter of spray box 2 mm		Load of tractor%	
Extruder 2 speed r/min		Outer diameter of spray box 3 mm			
Extruder 2 load%		Temperature after offline ℃			
Extruder 2 melting temperature		Outside diameter after off-line * wall thickness mm			

℃						
Extruder 2 melting pressure Mpa		Cutting action time S				
Extruder parameters				Mold temperature setting ℃		
Extruder 1		Extruder2		zone		zone
Power		Power		zone		zone
Speed ratio		Speed ratio		zone		zone
Output		Output		zone		zone
Energy consumption per ton		Energy consumption per ton		zone		zone
Drying temperature setting		Drying temperature setting		zone		zone
Suction time		Suction time		zone		zone
Filter cleaning time		Filter cleaning time		zone		zone
Temperature of barrel 1 zone		Temperature of barrel 1 zone		zone		zone
Temperature of barrel 2		Temperature of barrel 2		zone		zone
Barrel 3 zone temperature		Barrel 3 zone temperature		zone		zone
Barrel 4 zone temperature		Barrel 4 zone temperature		zone		zone
Temperature of barrel 5		Temperature of barrel 5		zone		zone
Barrel 6 zone temperature		Barrel 6 zone temperature		zone		zone
Temperature of cylinder 7 zone		Temperature of cylinder 7 zone		zone		zone
Flange temperature		Flange temperature		zone		zone
Suggestions for improvement：						

附件五 • 电气快速连接
Annex 5·Electrical quick connection

4.5.1 主机电柜与共挤机的连接
Connection between the main engine cabinet and the co-extrusion machine

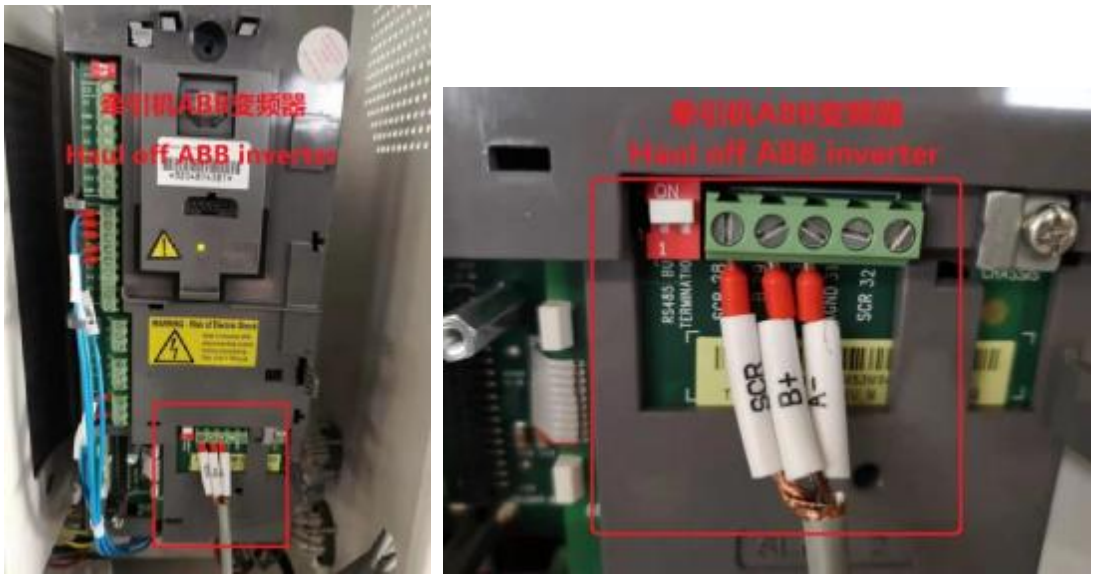


4.5.2 主机电柜与真空箱操作盒的连接
Connection between the mainframe electric cabinet and the vacuum box operation box

4.5.3 主机电柜与真空箱电柜的连接
Connection of the mainframe electric cabinet and the vacuum box electric cabinet

4.5.4 主机 PLC 与牵引机的通讯连接

Communication connection between Extruder PLC and tractor

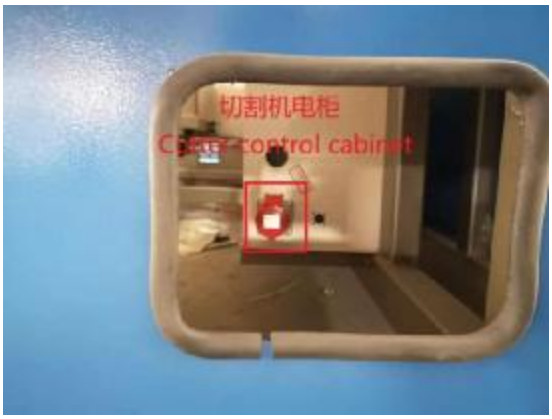


4.5.5 真空箱与牵引机电柜的连接

Connection of vacuum box and traction electrical cabinet

4.5.6 牵引机电柜与切割机电柜的连接

Connection of traction electrical cabinet and cutting electrical cabinet



4.5.7 编码器的连接 Encoder connection