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1. Machine tool maintenance warning.

1.1 The cooling pump is strictly forbidden to have no water idling and reversal.

1.2 The air source of the machine must be dry (humidity less than 50%).

1.3 Keep the machine tool clean. No iron filings are allowed in the shield. Remove iron dust every day.

1.4 Voltage requirement 380V (+10%; - 5%).

1.5 The machine parameters shall not be changed arbitrarily, especially those not mentioned in the maintenance specification. Do not arbitrarily change the machine tool electrical wiring.

1.6 Ensure good grounding of machine tool.

1.7 The machine is forbidden to work with fault.

1.8 The machine is forbidden to use corrosive coolant.

1.9 Machine tools are prohibited to use all kinds of oil that do not meet the requirements.

2. Safety precautions.

2.1 Operators and maintainers should carefully read the operation manual, maintenance manual, connection and installation manual of the machine tool before maintenance and repair. At the same time, we should know and be familiar with the all parts and structure of machine tools.

2.2 The user shall ensure that the machine is installed in a safe place. The radiation and vibration of other high heat sources should be avoided so as to avoid the failure of machine tools or loss of machine precision. All auxiliary conduits and cables shall not be in operation area to avoid danger, while ensuring safe maintenance, iron scrap and oil treatment space.

2.3 GFLR6 CNC lathes are equipped with fully enclosed standard protection. In some special occasions or cutting state, users need to prepare additional protection. The machine tool protection cover needs the user to maintain frequently, cannot move and change. The protective cover has an anti-impact transparent viewing window to ensure the safety of the operator and can clearly see the cutting process in progress. Opening any protective door at work can be dangerous.

2.4 It is forbidden to change the software or control parameters without authorization. Our company is not responsible for any unauthorized alteration.

2.5 To prevent major personal accidents, users should read the following basic safety before installing, operating or using machine tools.

Precautions.:

2.5.1 Follow the instructions in all manuals.

2.5.2 Wear approved industrial safety glasses and safety shoes.

2.5.3 It is forbidden to wear long sleeves, rings, watches, jewelry, gloves or other loose articles that may be wrapped in sports pieces, and no long hair.

2.5.4 Operators shall ensure that their body is far from the moving parts of machine tools, such as driving belts, knives, gears, etc.

2.5.5 Select suitable safe working methods.

2.6 Operators and maintenance technicians must be trained to operate and maintain the machine tools.

2.7 When maintaining the machine tool, the power supply should be cut off and the warning sign should be hung.

2.8 After maintenance, each action and individual debugging should be carried out manually, and the machine tool can be used after the repair is determined.

2.9 In daily maintenance, it is not suitable to use large flow of cutting fluid for a long time (more than 10min). After washing, the cooling liquid and chip removal on the machine tool working table should be removed in a timely manner.

2.10 During cleaning, the liquid should be avoided into components such as motor and switch.

2.11 Safety rules.

2.11.1 If didn't read and understand operation, programming and maintenance manuals, don't operate machine tools.

2.11.2 Do not start the machine until you understand the operation key of all machine tools.

2.11.3 Beginners are not allowed to operate the machine without the guidance of skilled personnel. Please consult the operator if necessary.

2.11.4 Pay attention to protect eyes and must always wear safety glasses with side cover.

2.11.5 Do not touch the moving parts. Remove watches, rings, jewelry, necklaces, etc. Don't wear loose clothing.

2.11.6 Protect the head. Wear a safety helmet when you may be at risk.

2.11.7 Hair should be kept away from moving parts.

2.11.8 Protect your feet. Wear safety shoes with steel toe covers and oil - proof soles.

2.11.9 Gloves are easy to be hung by machine tool and remove gloves before starting the machine.

2.11.10 Scattered items are easily swept away and remove all the bits and pieces before starting the machine tool.

2.11.11 Drug, over-the-counter drugs, prescription narcotic drugs and alcohol consumption may cause distraction and cannot operate machine tools.

2.11.12 When the protective door is opened, do not attempt to operate and operate the machine tool. Always ensure the safety of work and processing area.

2.11.13 When the spindle has stopped turning, it will be changed manually.

2.11.14 When the spindle has stopped rotating, the workpiece is changed.

2.11.15 After the spindle has stopped turning, the chip and oil can be removed. Note: use brushes and scrapings. Do not clean with your hands.

2.11.16 After the spindle is stopped, the workpiece or fixture and cooling nozzle can be manually adjusted.

2.11.17 After the spindle is stopped, it is measured.

2.11.18 When the main shaft stops, it will not open the protective door, and do not disturb the guard door.

2.11.19 When the machine power is cut off and the electrical insulation is insulated, the machine tool can be adjusted mechanically.

2.11.20 Be careful when changing the knife and holding the knife.

2.11.21 To protect eyes and machine tools, do not use compressed air pipe to remove iron dust.

2.11.22 Maintain working area lighting, and add auxiliary lighting if necessary.

2.11.23 To prevent the working area from slipping, keep the work area clean and dry, remove the chips, oil and obstacles, etc.

2.11.24 Do not lean the body on the machine tool, the machine should stand when starting.

2.11.25 Keep your working machine and other machine tools unobstructed to avoid being squeezed.

2.11.26 To prevent the workpiece from flying out, press the pressure plate, fix the workpiece, and use the workpiece when necessary.

2.11.27 To prevent tool damage, please use the correct spindle speed and feed rate. When the abnormal noise and vibration are noticed, adjust the spindle speed and feed rate with the manual multiplier switch. Ask the manager for help if necessary.

2.11.28 To prevent tool damage, rotate the spindle clockwise with the right-hand tool, and rotate counterclockwise with the left rotary tool.

2.11.29 To prevent the damage of workpiece and tool, do not start the machine tool when the tool and workpiece are in contact.

2.11.30 Blunt and damaged knives are prone to collapse, check knives and pole (clamps), keep the knives sharp, and the hanging knives are short.

2.11.31 Maintain normal lubrication and strictly follow the machine maintenance plan.

2.11.32 Some materials (such as magnesium) burn easily in dust and chips. The operator must consult the superior before processing these materials.

2.11.33 Pay attention to fire prevention, and make easy fuel and materials away from working area and hot iron scrap.

2.11.34 Prevent accidental movement of machine tools. Don't let the machine stop at HAND (manual pulse handwheel),

Unexpected rotation will drive the shaft movement.

2.11.35 Prevent accidental movement of machine tools. When the machine is not in production and no one is present, let the mode choose to stop in JOG mode.

2.11.36 Do not use machine tools in the air with volatile matter. The electrical equipment installed on the machine tool is for the use of ordinary factory, not explosion-proof.

2.11.37 Keep the machine tool clean and tidy, do not let the debris pile up, do not open the fixed protection device to clean the machine tool.

3. Machine maintenance.

The correct maintenance and maintenance of machine tools can ensure the stable and reliable operation of the machine tool and prolong its service life.

3.1 Functional parts

3.1.1. Main shaft box and main shaft encoder (main shaft box and encoder structure are shown in figure 1)

The machine adopts the self-made spindle structure, the spindle speed range is 60-4500r/min, and the main shaft is supported by angular contact ball bearing, which can meet the bearing requirements of axial and radial cutting force. The main shaft box and encoder structure are shown in figure 1.

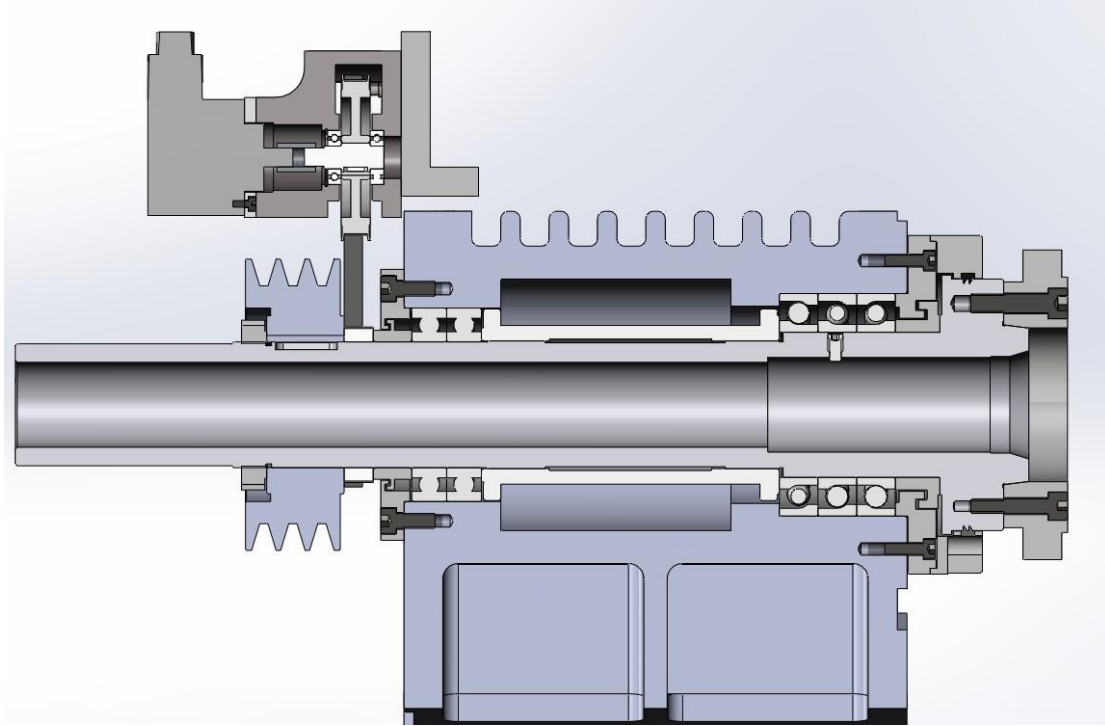


Figure 1: main shaft box structure diagram.

On the main shaft and the encoder shaft with synchronous cog belt wheel, synchronous cog belt wheel axial position correctly, namely the same side of the two pulleys should be in the same plane, otherwise, the synchronous belt will jump out or part of the belt (width) work and decrease the life of the belt. Machine tool use after a period of time, the encoder part of toothed belt will have a certain relaxation, without tension belt can affect the encoder adjust the normal response speed of the spindle rotation speed fluctuation, which may affect the precision of parts processing, especially the thread processing.

3.1.2 Longitudinal drive of bed and supporting plate (see figure 2)

The machine tool bed is high rigidity integral structure, the guide surface level is placed. The back zero iron in the bed has been adjusted to the appropriate position

when the machine is out of the factory, and it is not necessary to adjust it without special needs, so as to avoid causing the processing accident.

Vertical plate driven by ac servo motor through flexible coupling and ball screw straight, so that the connected to the leadscrew nut bed saddle for longitudinal motion, longitudinal ac servo motor for the encoder is installed inside, can direct feedback screw Angle signal. The rated speed of the servo motor is 2500r/min, and the deceleration to 2000r/min can achieve the vertical shift of 16 to 20m/min by a ball screw with a lead of 8mm.

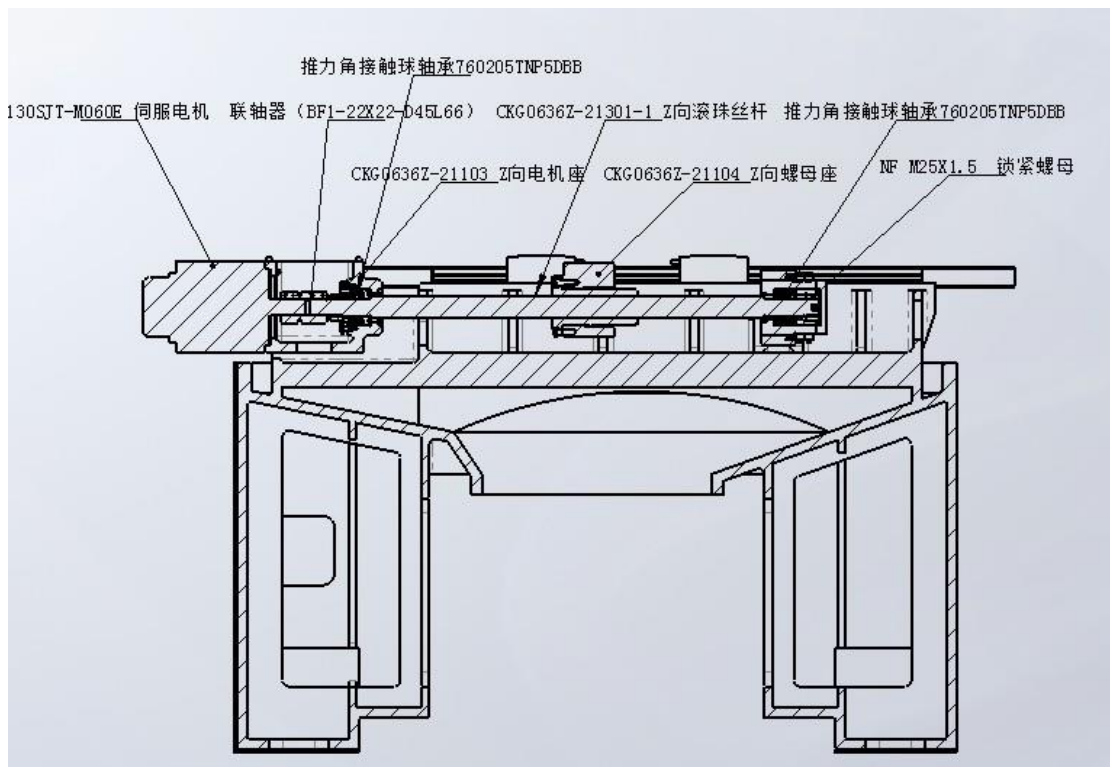


Figure 2: longitudinal drive structure of bed and plate.

3.1.3 Carriage (see figure 4 for the structure of the supporting plate)

The carriage is driven longitudinally by the longitudinal ac servo motor through the coupling to drive the longitudinal ball screw. The cross slide is driven by the transverse ac servo motor through the coupling to drive the horizontal ball screw pair to drive the horizontal movement.

The rated speed of the transverse ac servo motor is 2500r/min, and the ball screw with a deceleration to 2000r/min can achieve a horizontal speed of 16 to 20m/min through a ball screw with a lead of 8mm.

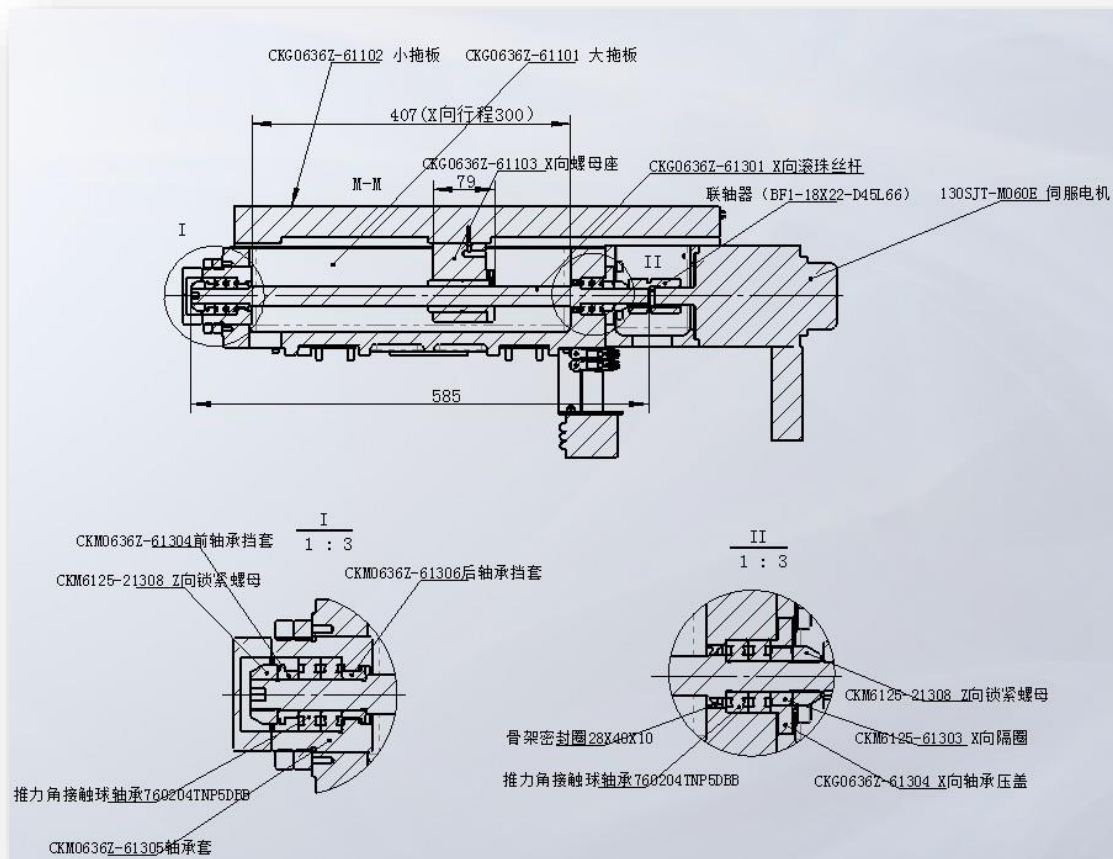


Figure. 3: schematic diagram of tray structure.

3.1.4 main drive (see figure 3)

The machine adopts Ningbo Gexin variable frequency motor, the speed regulation range is wide, the performance is superior. The main motor shaft is connected with the active pulley through the expansion sleeve, which is transmitted to the main shaft by the "V" belt. The belt will be loose and aged after a long time, and it needs to be tensioned or replaced regularly. Loosen the screw of the motor mounting plate and the bed body, and the electrical opportunity will move in the direction of the belt lengthening, and tighten the motor screw to the appropriate degree. And vice versa.

1. The belt tension is shown in the figure below.

The pre-tightening of the belt can be tested by the vertical force between the two inter wheel spans. Generally, the required force G is applied to the belt, and the deflection of the length of each 100mm span is 1.6mm f , that is.

$$f=0.016t \text{ to ensure}$$

The vertical force G and the resulting deflection f are determined according to the table value:

Check item	G (N/ quantity of belt)	t (mm)	a (mm)	f (mm)
Reference data	19.22	709.06	710	11.345

2. The axis of each belt wheel should be parallel, and the symmetric plane of the V groove corresponding to each belt wheel should coincide, and the error shall not exceed 20'

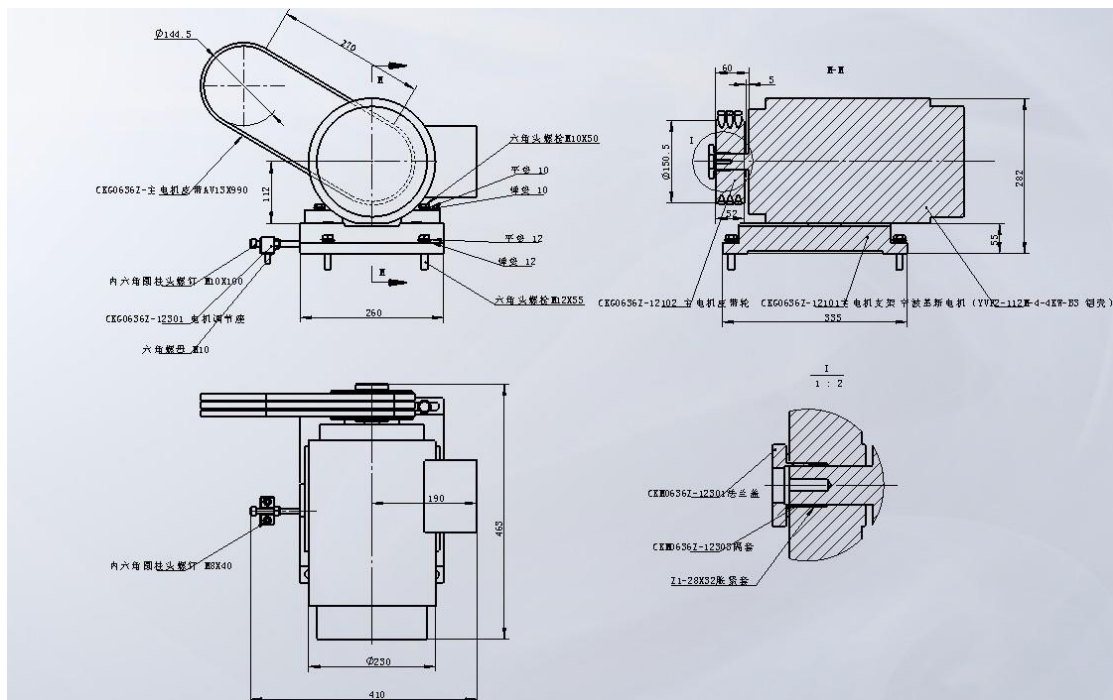
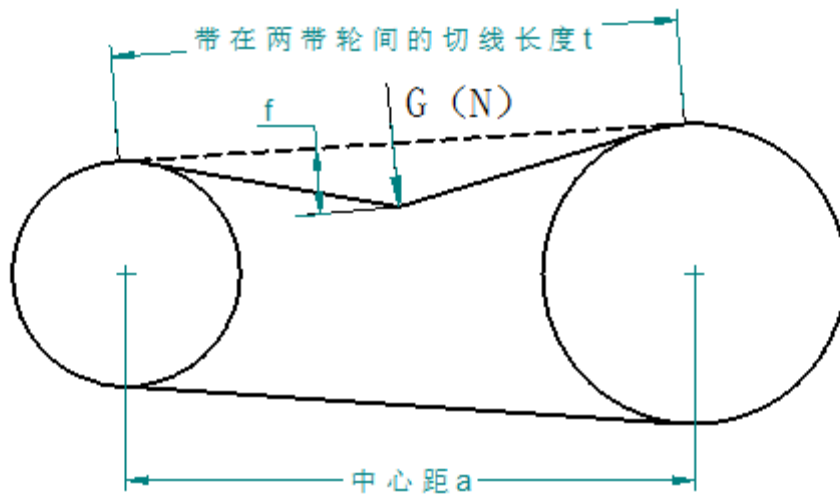


Figure 4: structure diagram of main transmission device.

3.1.5 Pneumatic clamping device (see figure 4)

The spring collet is connected with the three claws through the pull pipe. The three claws are connected to the rear end of the main shaft.

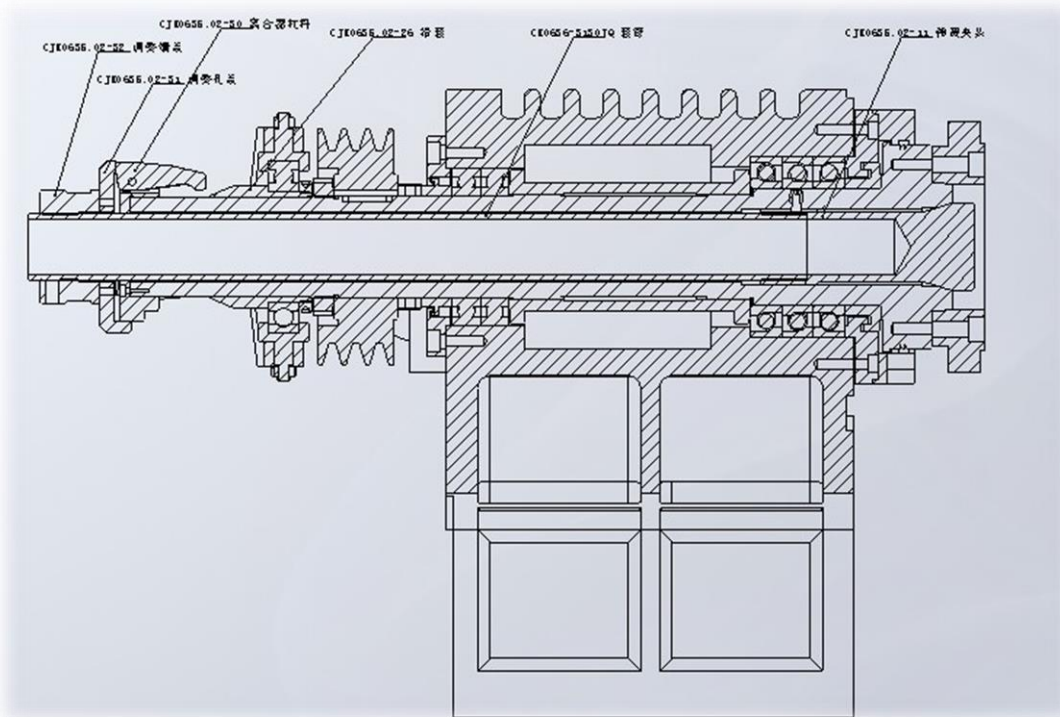


Figure 5: pneumatic clamping device.

3.1.6 Lubricating device (schematic diagram of lubricating system is shown in figure 5)

Automatic centralized lubrication system is used to supply oil to each guide rail and ball screw with automatic centralized lubrication pump, so as to ensure the normal working of each relative moving parts.

Lubrication system for the spring plunger pump lubrication system, by the electric lubrication pump, oil filter, oil machine, measuring and joint and pipeline, each lubrication point by an oil distribution components (measurement) to control the size of the oil.

The tank volume of the automatic centralized lubrication pump station is 1.8 liters and the oil injection cycle is 32min. The lubricating pump is installed on the right end of the machine tool. When the machine is first started or the machine is stopped for a long

time, please use the manual oiler to add sufficient oil to each lubrication line and lubrication point. The lubricating pump is equipped with low oil level alarm switch and the machine tool generates alarm when the oil is not enough.

The oil separation system consists of oil block, pipe joint and tubing. Please protect the pipeline, and regularly check the oil pipeline is damaged or blocked, because every time the oil injection quantity is limited, slightly leaking lubricating points for not oiling, machine motion pair of rapid wear or damage. Repair or replace any damage if found.

Lubricating system oil for cleaning machine 20, please pay attention to the cleaning of oil. Otherwise, the debris in the oil can clog the measuring parts, resulting in the failure of the metering parts.

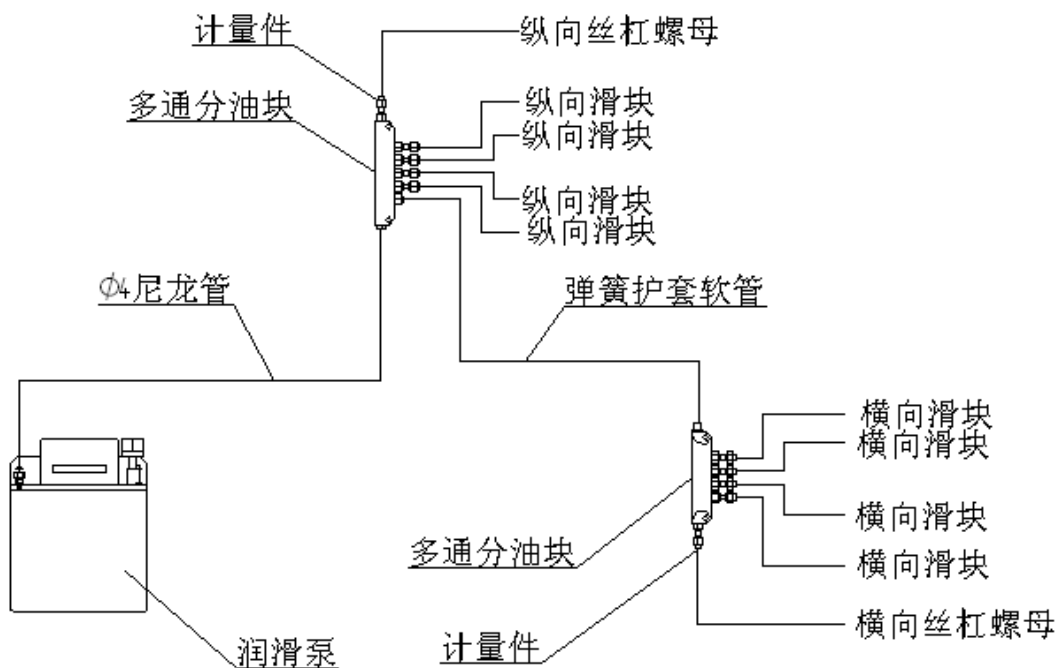


Figure 6: schematic diagram of centralized lubrication system of machine tool.

3.1.7 Cooling chip removal device (see fig.7 for cooling discharging device)

GFLR6 CNC lathe cooling system is mainly used in machine tool processing workpiece, the cutting tool is used to cool and scour the iron chip, so as to ensure the normal use of machine tool. The machine cooling system USES concentrated cooling, and the coolant is stored in the cooling water tank at the lower end of the machine. In the tank, the filter screen can filter the larger iron filings from the coolant. Small scrap of iron will

accumulate in the bottom of the tank or be glued to the filtration network to block the flow of coolant, so it is necessary to regularly clean the cooling box and filter. The cooling box has a capacity of 75 litres and is equipped with rollers, so it is convenient to move. The tank is equipped with a level gauge to observe the water level. When the water level is lower than 35 liters, please replenish the coolant in time to ensure the flow of the pump.

Note: check the coolant surface daily, clean the iron filings in the iron filings in time, and then pull out the iron filings, and the water tank should not be pulled out.

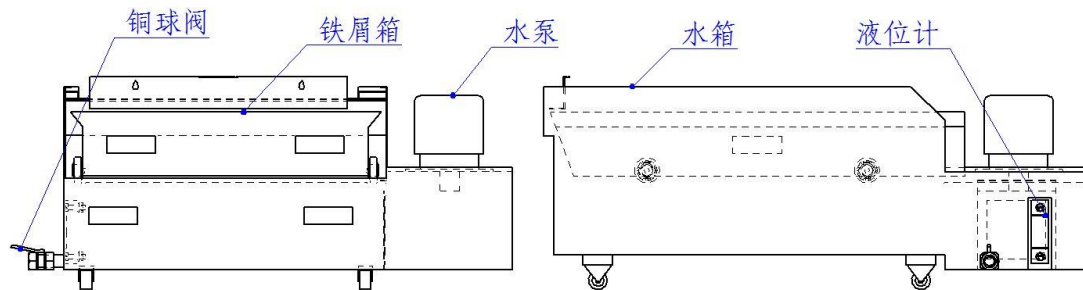


Figure. 7: schematic diagram of cooling chip

3.2 Operator's daily maintenance and maintenance.

3.2.1 Lubrication system.

Check whether the pressure is normal during lubrication system (see operation manual). Check whether the oil level in the oil tank of the lubrication system is kept in the correct position, such as the oil solution should be added in time.

3.2.2 Cooling system.

Check the liquid level of the cooling system and replenish the coolant in time.

3.2.3 Cleaning and maintenance.

Daily work after the operator should remove machine tool, fixture and guide rail protective cover, such as residual chip and cutting fluid on the surface, and will be rid of the chip, chip storehouse in time clean up the iron filings in the iron box, at the same time cleaning the workplace, to keep the workplace clean and health.

3.3 The operator checks and maintains the project every week.

3.3.1 Electric control cabinet of machine tool.

Electric cabinet internal and control system, electrical components should be kept clean, no dust; Meanwhile, check the working condition of cooling fan and air filter in the cabinet and keep clean.

3.3.2 Machine tool and sensor, motor.

Check the machine tools and sensors, whether there is dust, chip and sludge accumulation on the motor, if there is any need to clean it up, avoid making mistakes and damage machine tools.

3.3.3 Cooling system.

Check whether the cooling system supply is normal, and whether the cooling pump and motor are abnormal.

Check whether the coolant liquid is spoiled, if the liquid has gone bad, the new coolant should be replaced to prevent the liquid from corroding the parts and electrical components of the machine.

Cleaning plate type filter to ensure that iron ducts do not enter the cooling pump into the pipeline. And from the coolant surface skimming the floating guide lube oil, can choose oil and water separator.

3.4 The operator checks and maintains the project monthly.

3.4.1 Maintenance and cleaning of each coordinate guide and ball screw of the machine tool.

a) x-coordinate guide, ball screw pair.

Due to the structure of the guide shield itself, after working for a period of time, the chip and cutting fluid are easy to enter the bed of the X coordinate movement;

Therefore, it should be maintained and cleaned regularly.

First, open the x-coordinate of the machine tool before and after the guide rail protective cover, and remove the cutting and cutting fluid on the bed, guide track and ball screw. Special attention should be paid to the removal of debris and cutting fluid

on the guide rail and ball screw without damaging the rolling track surface of the guide and ball screw.

b) Z coordinate guide, ball screw pair.

Check the cleaning conditions of z-coordinate guide and ball screw, and remove dirt, sludge, chip and other debris from the guide and ball screw. The rolling track surface of guide and ball screw should not be damaged.

3.4.2 Cooling system.

Clean the cooler every month. The coolant treatment shall comply with the current environmental requirements of the machine.

3.4.3 Electrical devices.

a) check the operation of all electrical safety devices.

Including: lubricating system, pneumatic system alarm device, timer, pressure switch, travel switch, proximity switch, etc.

b) check all cables, conduits and lines, such as damp, abrasion, weak connection and corrosion of terminals.

c) check the general working conditions and cleanliness of transformers and motors.

d) find out that the problem should be repaired in a timely manner, and remove dust, sludge, chip and cutting fluid and other sundries in each motor component of the machine tool.

3.5 Professional maintenance personnel check and maintain the project quarterly.

3.5.1 X and Z rectangular guide rails.

Check the condition of slide guide and guide rails. The "scratches" on the surface of the guide track indicate that the metal particles have been entered by the guideway dustproof sheet. When the metal particles enter the dustproof sheet, the material of the dustproof sheet will be destroyed and leave a trace, so that the dustproof film cannot contact with the guide. As a result, the anti-dust film cannot effectively protect the track. This phenomenon should be cleaned and repaired in time. Remove the dust

film on the guide rail to clean the guide rail, and replace the anti-dust film of the guide rail, and reassemble the new dustproof film.

3.5.2 X, z-axis ball screw pair.

Check the working condition of the dustproof ring on each axle ball screw nut. The "scratches" on the surface of the ball screw roller show that the metal particles have been entered into the ball screw nut by the dustproof ring. When the metal particles enter the dustproof ring, the material of the dustproof ring is destroyed, and the trace is left, so that the dustproof ring cannot contact the raceway. As a result, the raceway cannot protect the raceway effectively. This phenomenon should be cleaned and repaired in time. If the situation is serious, the ball screw should be removed to repair and replace the dustproof ring.

3.5.3 X, z-axis drive and support.

Check whether the X, Z axle bearing and lock nut are loose.

Check whether the elastic coupling connection between X and Z drive motor and lead screw is normal.

3.6 The operator checks and maintain items every six months.

3.6.1 Cooling system.

Check the use of pipes and components in the cooling system and replace damaged hoses and components. Clean or replace the pipes, coolers and filters of the cooling system every six months (coolant, filter element).

3.7 Professional maintenance personnel check and maintain the project annually.

3.7.1 Mechanical part inspection.

a) check the rolling way of each bearing, linear rolling guide, ball screw, etc.

Rolling along the track surface is bound to produce a friction, resulting in a visible trajectory consistent with the roll profile, known as the raceway. Every year, check for signs of damage to the "raceway". Such as: dents, cracks, scratches, scratches, erosion and other damage of hardened layers.

b) cleaning

Clean the bearings, linear rolling guides and ball screw pairs thoroughly with detergents (e.g., aviation gasoline, etc.) to remove impurities deposited in the raceway. After cleaning, dry with clean, dry compressed air. Be careful not to blow off the roller when blowing dry roller and raceway.

c) reload the notice.

The machine tool X - axis ball screw should be pretensioned when loading, and the stretching torque of pre-stretching is about 20Nm. After stretching, the screw bearing group shall not produce axial clearance.

If machine X, Z axis ball screw pair between the nut and screw due to use for a long time after the clearance, should be made for the ball screw vice nut to additive load adjustment (the user can also please professional ball screw plant maintenance).

d) linear rolling guide, sliding block, screw bearing pedestal and other important parts are all used with high strength screw, and the user shall not replace with ordinary screws. The tightening torque value of each screw is shown in table 1.

Table1:

Screw size (mm)	M6	M8	M10	M12	M14	M16	M24
Tightening torque (N.m)	9	24	45	90	110	140	450

e) Machine level

Check the level of the machine tool. Place a precision leveler on the worktable, adjust the floor adjustment screw, so that the level meter reading does not exceed 0.02/1000. Check it again.

3.7.2 Inspection of machine tools.

No load test on all motor of machine tool. When the motor is separated from the load, the current value of the motor is measured with an ammeter, and it is compared with the value on the motor sign. If the value exceeds the given value on the motor sign, further examination should be made to find out the cause. If the motor is working under continuous overload, the motor overload protector shall be able to disconnect the motor circuit.

3.8 Machine maintenance of periodic table (see table 2)

Table 2:

Machine tool repair, maintenance	Frequency						Quality			
	Per day	Per week	Per month	Per quarty	Per half year	Per year	Check	Maintenance	Clean	Replace
Repair and maintenance parts										
Lubrication system										
Oil tank level, pressure gauge reading	✓						✓			
X, Z axis ball screw and linear guide lubrication.			✓				✓			
The filter element of the filter.					✓				✓	✓
Pneumatic system										
Pressure gauge reading for pneumatic system.	✓						✓			
Oil cup liquid level			✓				✓			
Air separation	✓						✓			
The cooling system										
Cooling tank, cooling line.					✓				✓	
filter				✓					✓	✓
Cooling fluid			✓	✓			weekly			Quarter
mechanical device										
X, Z-axis linear guide, ball screw pair maintenance mechanism.			✓				✓		✓	
Main bearing, guide way, ball screw.						✓	✓		✓	

Linear guide, ball screw dust scraper				√			√		√	√
X, Z screw bearing.				√			√	√		
Level of machine tool						√	√	√		
Detection system										
Air source filter element.			√				√			
Machine tool electrical										
motors						√	√			
Electrical components (such as travel switch, proximity switch, etc.)			√				√	√		√
electric cabinet		√					√		√	

Hydraulic parts (optional)

1. Failure and elimination of hydraulic system.

1.1 failure and elimination of vane pump.

Fault	Reason	Troubleshooting
No oil discharge	Wrong rotation direction	Stop immediately and correct the motor rotation direction.
	Pump no rotate	Repair coupling
	Pump shaft fracture	Repair or replace pump.
	Oil suction plug	Check the suction line
	Tank filter plugging	Cleaning filters
	Insufficient oil tank filter capacity	Replace
	The oil viscosity is too high	Replace the oil
	under speed	Regulation speed drive
	The suction pipe is not tightly sealed.	Checking and disposal

	Oil surface under oil tank filter.	oiling
	Vanes cannot slip out of rotor slots	Repair the pump
The noise is big	Suction tubing is too thin	Expanding suction pipe
	Oil tank filter block.	Cleaning filter
	Insufficient oil tank filter capacity.	Change filter
	The oil viscosity is too high	Change the oil
	Double pump suction connection error.	Rematch the pipe
	The suction pipe draws in air.	To tighten
	Pump oil seal suction air.	Replace the seal ring
	There are bubbles in the tank	Check suction pipe
	The oil level is too low	Refill
	Vanes cannot slip out of rotor slots	Repair the pump
	Noise from the coupling.	reassemble
	Air filter clogging or insufficient capacity.	Clean or replace it.
	Speed is too high	Reduce the speed
	Pressure is too high	Reduce the pressure
	Bearing wear	replace
	CAM ring wear	replace
	The pump cover is not tight.	tightening
	Pump damage	replace
Oil shortage	No oil discharge out	According to the above method processing
	The inhalation vacuum is too large.	Check suction pipe
	Excessive internal leakage	Repair the pump
	The pump cover is not tight.	tightening
	Viscosity of oil is too high	Change the oil

1.2 Fault and elimination of overflow valve.

Fault	Reason	Troubleshooting
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Pressure is too high or too low	Improper pressure setting	To reset
	Pressure disorder	Check pressure gauge
	Pilot valve is not present on the valve	Repair or replace the pilot valve.
	Balance piston motion is not good.	Repair pilot valve
	Spring force is too weak	Replace the spring
	Pilot valve seat to balance piston seat wear.	Clean or replace
Pressure instability	Balance piston motion is not good.	Check damping hole
	The pilot valve is unstable.	repair
	Pilot valve wear	replace
	There is air in the oil.	Air out
	The pilot seat has foreign body.	Open the cleaning
Abnormal pressure fluctuation	Pilot valve wear	Replace pilot valve
	The oil drain port has air	Air out
	Poor oil tank piping.	repiping
	Flow rate is too high	Replacement control valve
	The oil outlet has back pressure.	Direct derivation

1.3 Failure and elimination of pressure reducing valve.

Fault	Reason	Troubleshooting
Pressure is too high or too low	Improper pressure setting	To reset
	Pressure disorder	Check pressure gauge
	Pilot valve is not present on the valve	Repair or replace the pilot valve.
	Balance piston motion is not good.	Repair pilot valve
	Spring force is too weak	Replace the spring
	Pilot valve seat to balance	Replace

	piston seat wear.	
Pressure instability	The valve core moves badly.	Check damping hole
	The pilot valve is unstable.	repair
	Pilot valve wear	replace
	There is air in the oil.	Air out
	Drainage has a back pressure	check

1.4 Fault and exclusion of electromagnetic directional valve.

Fault	Reason	Troubleshooting
Poor movement	Due to the poor spring, the valve core cannot be reset.	Replace the spring
	The valve core moves badly and moves slowly.	Clean the filter or replace the hydraulic oil.
	Bolts are tightened excessively or the oil temperature is high to deform the valve body.	Loosen bolts to check valve core or replace.
	Poor electrical system	Check the electromagnet coil and socket.
The coil of the solenoid valve is burned	Defective coil insulation	Replace electromagnetic coil
	The magnetic coil is jammed.	Replace the electromagnet coil.
	The voltage is too high or too low.	Check the voltage to adjust properly.
	Conversion pressure is specified above.	Reduce the pressure and check the pressure gauge.
	Conversion pressure is specified above.	Check the flow control valve.

	Back pressure of oil return	Return the oil directly to the tank.
Internal leakage, external oil leakage.	Sealing ring wear	replace
	Bolt looseness	tightening

1.5 Oil temperature is too high and low

Fault	Reason	Troubleshooting
Significant rise	Pressure adjustment valve pressure is too high	Reduce the pressure
Significant rise	The high pressure is discharged through the overflow valve.	Check the unloading oil
	Low viscosity or pump leakage.	Repair pump or replace hydraulic oil
	Oil shortage	Refueling or adding a coolant

1.6 Hydraulic cylinder and hydraulic motor failure and elimination

Fault	Reason	Troubleshooting
Irregular motion	The oil circuit is mixed with air.	Air out
	Piston oil seal and piston rod oil seal too tight.	Replace the oil seal
	The piston seal and piston rod seal center are inaccurate	centering
	The internal diameter of hydraulic cylinder is defective.	Processing inner diameter
	Guide sleeve too loose or too tight, stuck, bad lubrication	check
	The load is heavy and the action is slow	Increasing lubrication
	Poor flow adjustment valve	cleaning
	Pressure adjusting valve; Flow adjustment valve and others	Air out

	resonance	
	Hydraulic cylinder and hydraulic motor leak large	Reduce leakage
	The sequence valve pressure setting is close to the overflow valve	Increase the pressure of the overflow valve.

1.7 Maintenance of hydraulic oil.

1.7.1 Use temperature below 60 ° to the best;

1.7.2 Control pollution, because oil and liquid pollutants will accelerate the oxidation of oil;

1.7.3 Avoid water mixing into the working oil, because water will deteriorate the working oil;

1.7.4 The hydraulic oil of different manufacturers shall not be mixed;

1.7.5 Control hydraulic system leakage oil;

1.7.6 Work oil should be checked regularly

1.8 The hydraulic system regularly checks the main points.

Inspection area	Inspection items	Inspection period	Inspection method
Oil tank (including working oil)	Oil leak	Week	Visual observation
	Amount of oil	Week	Visual observation
Pump	Cleanliness and character of oil.	3 months	Dependency analysis
	The oil temperature	Week	Oil thermometer or by touch
	displacement	3 months	The speed determination of the drive
	pressure	3 months	Pressure gauge
	The noise	3 months	Hearing or noise meter
	The surface temperature	3 months	A thermometer or by touch.

	Oil seal sealing ring leaking or sucked in air	3 months	Visual observation or Check bubble noise
Coupling	Looseness, wear	One year	Visual observation
Pressure control valve	Set value and action condition.	3 months	Pressure gauges or drive conditions
Flow control valve	Set value and action condition.	3 months	The speed of the drive.
Directional control valve	Action status	3 months	Action check of drive.
	The internal leakage	One year	Test measurement
The filter cooler	Coil insulation resistance	One year	Use 500mV power to measure.
Piping and pipe clamp (tube hose)	cleanliness	3 months	cleaning
	cleanliness	month	Visual observation
Rotary hydraulic cylinder	Cooling capacity	3 months	cleaning
	leaking	3 months	Visual observation
Pressure control valve	Oil leak	3 months	Visual observation
	Relaxation and vibration	Week	Visual observation , by touch or vibration meter
Directional control valve	The action time	Week	Measuring movement time
	Vibration, shock	Week	Visual observation , by touch or vibration meter
The filter cooler	Oil leak	Week	Visual observation
Piping and pipe clamp	Lubricating oil supply	day	Go to work immediately inject lubricating oil
	cleaning	Half year	Complete decomposition and cleaning