Automatic tool changing machining center electric spindle

RTM120X103-30-24-7.5-380V

User Instructions

BT30 380V 13.5A

400-800Hz 12000-24000rpm

2.9-6.0Nm 7.5Kw(S1) 9Kw(S6)

Catalog

Product overview

1.This spindle is built-in type spindle motor, built-in three asynchronous motors,by the inverter control.As the spindle has a compact structure,high power, big torque, small vibration, low noise characteristics,so it can achieve high speed,high powe cutting,high precision and high stability operation.

2.The bearing of spindle use grease lubricated angular to contact bearings,can be achieved lifelong lubricating within the life cycle.

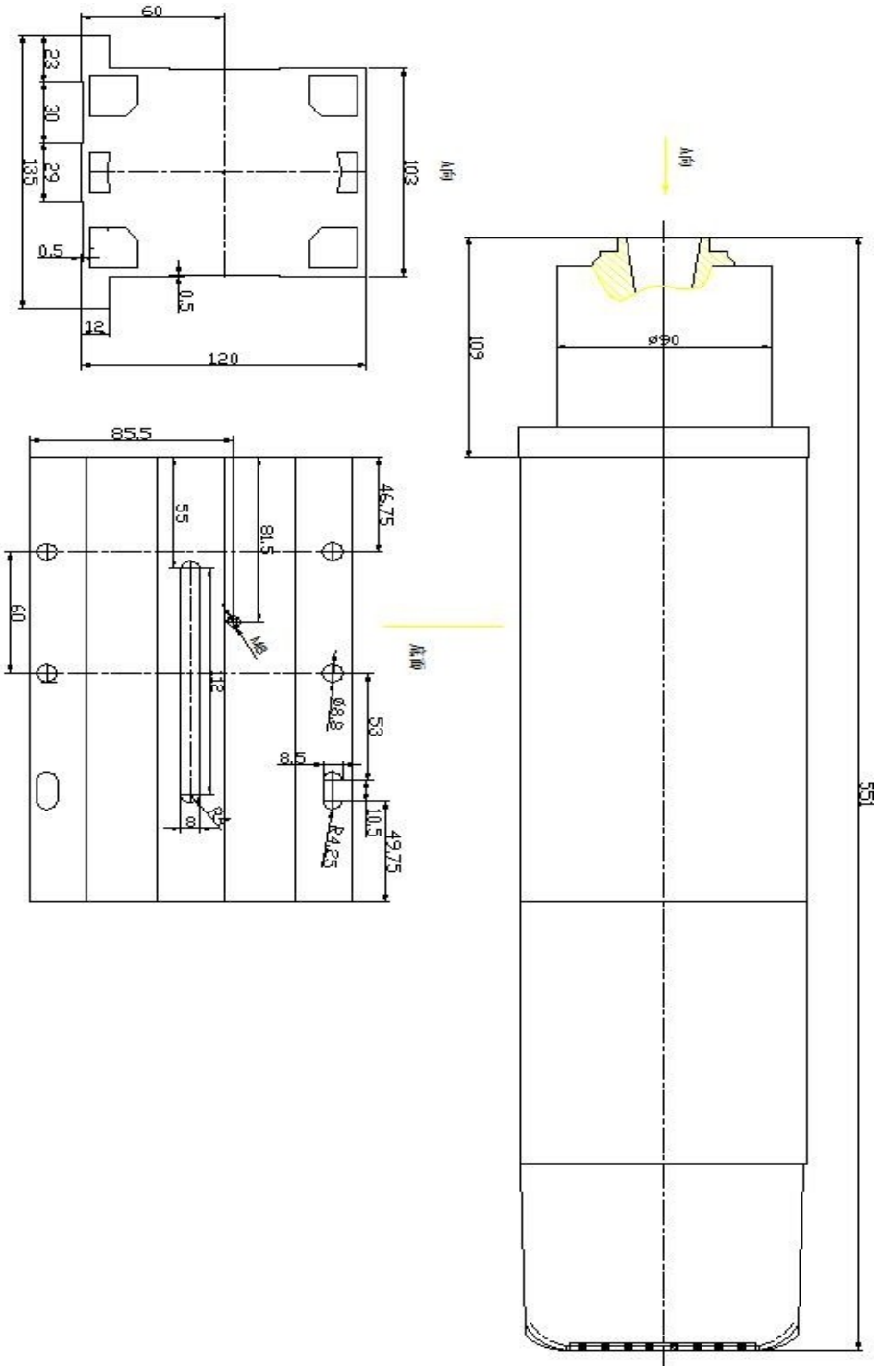
3.This spindle uses air cooling to cool the motor and front and rear bearings. The wind is provided by the fan at the rear end, from the rear of the spindle through the inner and outer air slots directly to the front of the spindle, thereby taking away the heat generated by the high-speed rotation of the spindle, achieving thermal balance, and keeping the temperature of the electric spindle within a certain value.

4.The spindle built-in PTC 140 temperature sensor(Technical parameters are visible in other sections of this specification),you can read it anytime if you need to protect the motor temperature.

5. The tool clamping methods:this spindle built-in automatic tool change device,shank form is BT30.

RTM120X103-30-24/7.5

Automatic tool changer electric spindle outline drawing



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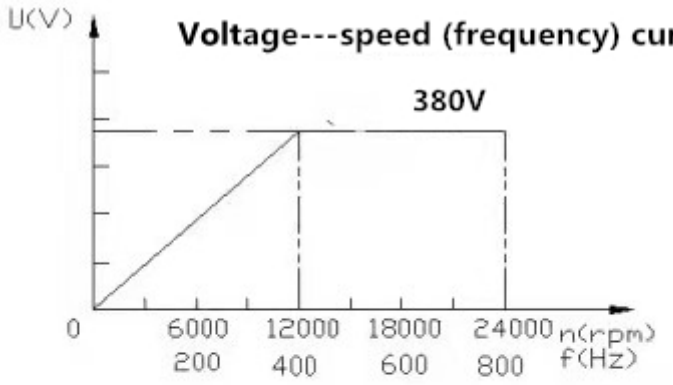
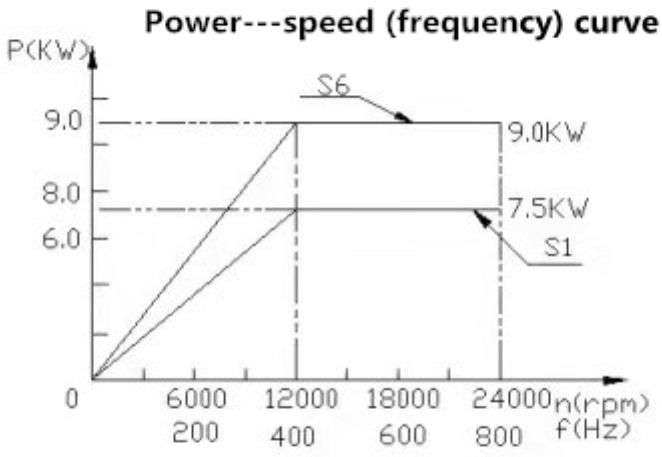
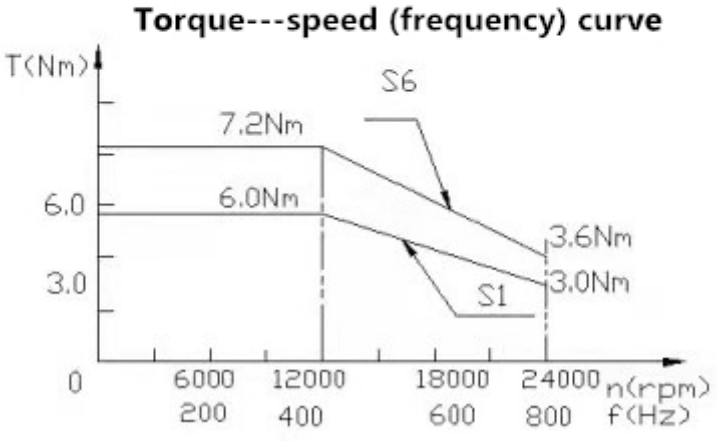
Automatic tool changer electric spindle parametric curve graph







RTM120X103-30-24/7.5

Automatic tool changer electric spindle technical parameters

Spindle model	RTM120X103-30-24/7.5（380V）	Voltage	380V	Electric current	13.5A
Rated speed	12000rpm	Rated frequency	400Hz	Rated power	7.5KW
Peak power	9KW	Rated torque	6Nm	Peak torque	7.2Nm
Motor Pole	4 Pole	Maximum speed	24000rpm		

Technical parameters

No.	project	Standard
1	Spindle blowing dust/seal gas pressure(MPa)	0.2-0.25
2	Spindle gas seal gas flow（L/min)	65±10(When on Working）
3	Cooling air fan pressure（MPa)	≧0.25
4	Cooling air fan flow（L/min)	≧2.5
5	Spindle static state pulse（μm）	≦3
6	Spindle vibration（mm/s）	≦1.0
8	Spindle assembly method	Bottom mounting（6-M8）
9	Motor windings Pressure test（V/M）	1000V//1 minute withstanding Voltage test
10	Tool Interface	BT30
11	Inverter Specifications	7.5KW（380V)
12	Fitment	Woodworking machinery, polishing industry, etc.

Spindle installation explanation

1.Fan cooling system description

When the spindle rotates, the rear fan system must be started to ensure the correct supply voltage and the supply voltage is 12V.

2.Air sealing control (AS)

In order to prevent water or impurities enters internal of the spindle,spindle will have gas sealing device,the gas seal machine must be started start with the machine at the same time. And the need to go through multi-stage filtration.

3.Compressed gas quality requirements

The quality requirement of gas which is used in gas seals:

Oil content：＜ 0.01mg/m³

solid particle：＜ 5μ m

Pressure dew point：＜ 7.5℃（0.7MPa）

3. Running-in program instructions

Only all monitoring issued no failures operational signals,at the same time,all safety devices have been installed and working properly,then allow start spindle.

Note: new or spindle which is not used for a long time must to be running slowly.First,start run spindle for half an hour as 25% of the maximum speed,then increase to 50% of the maximum speed,to run 15 minutes,finally, increase to maximum speed.It’s need to check the temperature of the spindle during the whole process, spindle will get hot, but not hot hand, if the spindle becomes hot, pls stop the operation and contact our customer service department.

5.Product backend interface instructions

No.	Function	Definition
1	Gas sealing （ Protection of impurities into the spindle 0.2-0.25MPa）	Φ6
2	Return air（piston reset 0.35-0.45MPa）	Φ6
5	Power supply（Spindle power lines with thermistor）	U/V/W/ Ground wire
6	Intake air（Spindle tool open 0.5-0.6MPa）	Φ6
7	sensor（spindle tool change signals 24V）	Tool close/open
8	fan（spindle cooling）	12V

6. **PTC140 Temperature coefficient thermistor parameters**

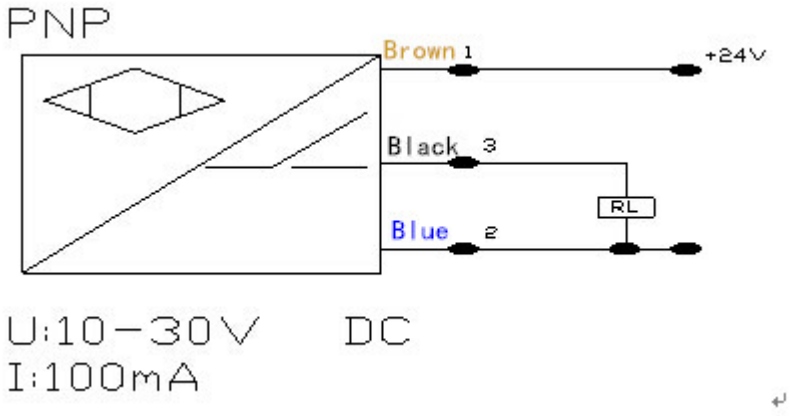
Our products are equipped with a single thermistor PTC140, it can be used for spindle temperature protection.

Parameter name	Parameter symbol	Single core	Three core Series connection	unit
Maximum DC working temperature	Umax	30	30	V
Rated control temperature	Tk	Designed according to user		℃
Rated control temperature tolerance	△T1	±5℃	±5℃	℃
Rated control temperature tolerance	△T2	±0.5℃	±0.5℃	℃
Resistance value on 25℃	R25	≤100	≤300	Ω
Rated control temperature on -5℃ resistance value	Tk-5℃	≤550	≤1600	Ω
Rated control temperature on +5℃ resistance value	Tk+5℃	≥1330	≥4000	Ω
Rated control temperature on +15℃ resistance value	Tk+15℃	≥4	≥12	KΩ
Thermal response time	Ta	≤5	≤5	S
Dielectric strength	Uis	AC2.5	AC2.5	KV
Maximum control temperature	Tkmax	180	180	℃
Maximum allowable storage temperature	Tmax	180	180	℃
Minimum allowable storage temperature	Tmin	-40	-40	℃

7. **Product Tool Change Signals Description**

Sensor Model (0-24V, PNP), The spindle built two sensors.wiring Diagram is as follows:

1. Response broach knife signal, when the knife handle is hang, black sensor output signal;
2. Response loose knife signal, when the knife jaws open,black sensor output signal;

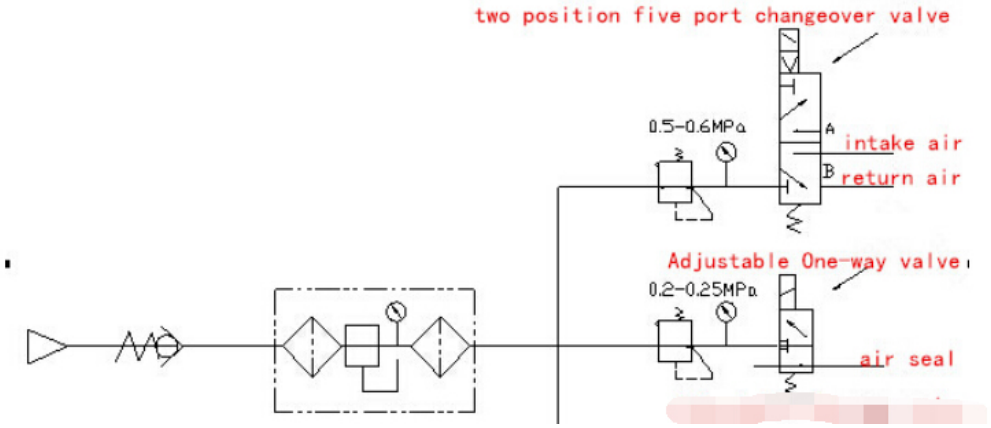


8. **Product backend pneumatic description**

Total air intake→one-way valve→ pressure gauge→filter

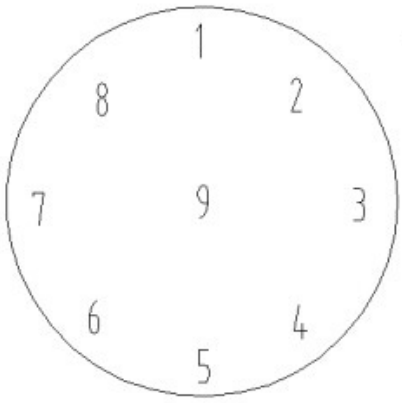
-- A、B (Two position five port changeover valve) change-over valve
A→intake air（0.5-0.6MPa)
B→Quick exhaust value →return air

-- Adjustable One-way valve→air seal（0.2-0.25MPa)



9, wiring definition

Power supply, thermal, fan



Thermal 1 5

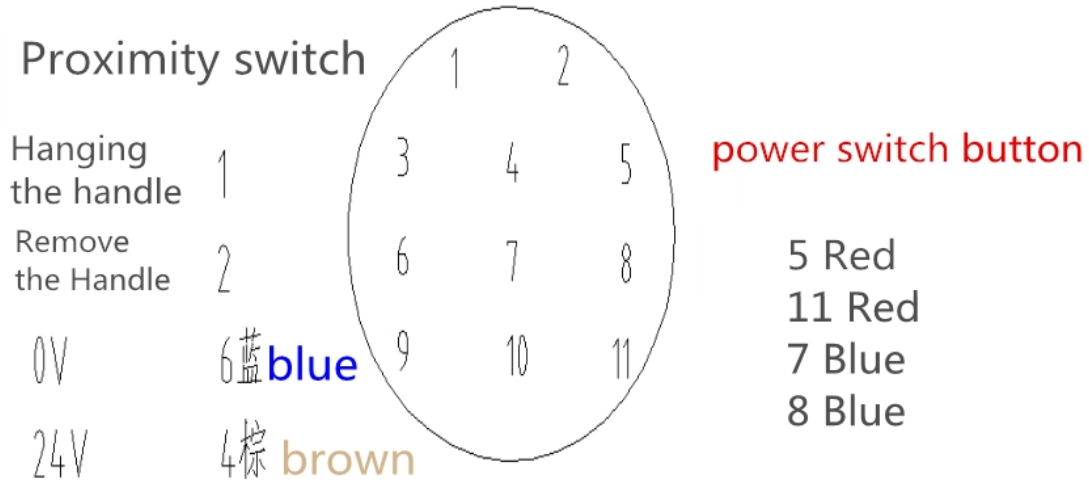
Fan 3 Black 9 Red

Power supply

4 Red U 6 Black V 8 Blue W

Ground 2 Yellow-Green Wire

Proximity switch and push button switch



The usages of the product and warnings

Matters need attention when you install this spindle

1. Before installed,please read this manual carefully,then operate this sapindle according to instructions requirements specification;
2. When installed, please carefully, pay attention to personal safety and to avoid injuries occurred during the installed process;
3. Suggest tool used by spindle compliance with IOS1940 specifications dynamic balance level within G1.0.
4. Do not use any tools tapping spindle;
5. Do not use sandpaper and grinding wheel to wipe or grind in axis core and taper hole;
6. Use special removal tool to remov the lock nut and the tool;
7. Untrained personnel can not disassemble and operate electric spindle;

Attention to maintenance and maintenance

1. Electric spindle storage temperature is 20 ℃ ± 10 ℃, humidity ≦ 85%, to allow time to store up to three months;
2. Electric spindle most suitable ambient temperature is 20 ℃ ± 10 ℃, bearing life can achieve the desired optimum value;
3. The power cord must take waterproof measure, electric spindle housing must be grounded;
4. Electro-spindle must not exceed nameplate parameters;
5. When electric spindle stop, should cut off the power, it must maintain a certain time after spindle completely stopped to wait spindle heat dissipation, then cut off the coolant, If you disable a long time, you need use compressed air,to remove the residual coolant liquid in the cooling pipe.
6. Not allowed to use any mechanical way to forced braking in the shaft;
7. after using the spindle every day,you should wipe spindle taper,then smear with rust oil;
8. Workplace must be clean, there should be strict dust control measures to prevent foreign matter enter the spindle.

Product common malfunctions&method of exclusion

Fault phenomenon	Reason	Method of exclusion
Electric spindle is not running after boot	1、No inverter power output or set incorrectly	Check that VFD supply three-phase output voltage and setting method
	2、Spindle plug is not inserted	Check the electrical spindle plug and connection.
	3、Bad plug connector	
	4、Bad stator line package	Replace line package
Shutdown after a few seconds of the boot	1、Electric spindle feed water bad insulation line package	Drying line package
	2、Electric spindle high temperature cause line package insulation damaged	Replace line package
	3、Electric spindle lose phase to run,then cause overcurrent protection blackout	Check the electric spindle connection
	4、Start time is too short	Increase the acceleration time
Electric spindle smoking or the housing hot after a few second of the boot	1、Inverter output voltage, frequency are not match the use of electric spindle voltage and frequency	Check the VFD and the spindle voltage, frequency
	2、The VFD is not set correctly	Reset the VFD
Locking nut loose when it is started	Wrong direction of rotation	Change the direction of rotation
Spindle have big noise and vibration	1、Bearing wear seriously	Replace the bearing
	2、Precision of parts damaged,it’s effect dynamic balance	Calibration of dynamic balance
	3、Big beat of Spindle	Replace the spindle
Locking nut loose when it is stoped	Stop time is too short	Increase the deceleration time