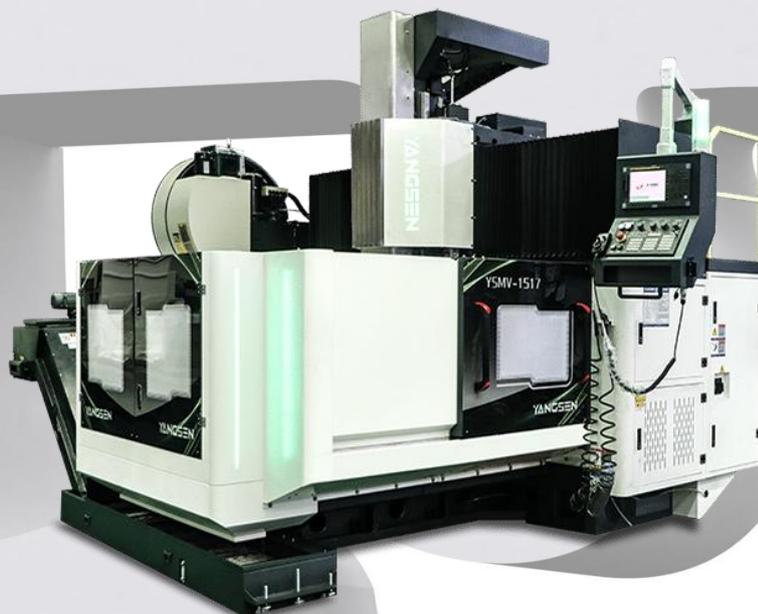


客户的需求就是我们所做的一切

All We Do Are Clients Demand



**厦门扬森机械科技有限公司**

Xiamen YANGSEN Machinery Technology Co., Ltd

**Technical Documents  
YSMV-1517 Double Column Machining**

**Xiamen Yangsen NC Equipment Co., Ltd.**

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## 1. General introduction of YSMV-1517 gantry CNC machining center

### 1. General introduction

#### 1.1 Introduction

This technical task book is used for the ordering, design, manufacture, installation, commissioning and acceptance of the CNC gantry type machining center and auxiliary equipment of the user.

#### 1.2 Installation position of gantry type CNC machining center

The gantry type CNC machining center described in this technical task book is installed in the workshop of the user.

### 2. Basic environment

2.1 Power supply voltage: AC 380V+/-10%, 50Hz+/-5%, 3-phase 5-wire system.

2.2 Use environment: The user is responsible for the power supply from the workshop to the equipment control cabinet.

### 3. Color of gantry CNC machining center

The color of the gantry type CNC machining center adopts the international standard color, and the user provides a standard sample for painting.

### 4. The standards that the gantry type CNC machining center meets

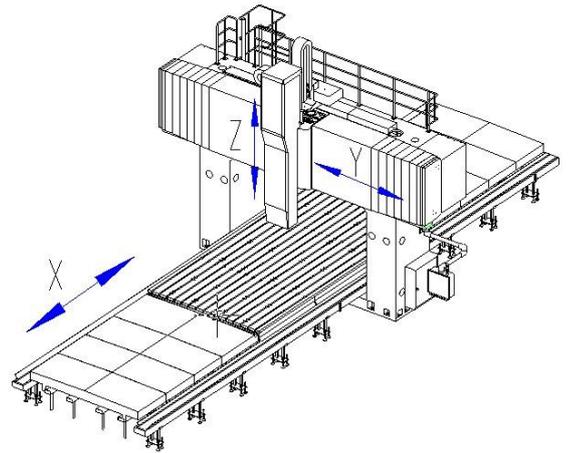
The ambient temperature detected by GB/T shall comply with the provisions of GB1093-89

Accuracy implementation standard: GB/T19362.2-2017

Machine tool electrical conforms to GB 5226.1-2008 electrical standard

### 2. The main structure and technical characteristics of YSMV-1517 gantry CNC machining center

The overall layout of the machine tool is a fixed-beam beam structure, and the worktable moves forward and backward; the left and right columns and the bed are distributed on both sides of the workbench. The gantry table moves forward and backward in the X axis, the ram moves vertically in the Z direction on the slide plate, and the slide plate and the ram move horizontally in the Y direction on the beam.



Workbench moves vertically

(X Axis)

The saddle moves along the beam

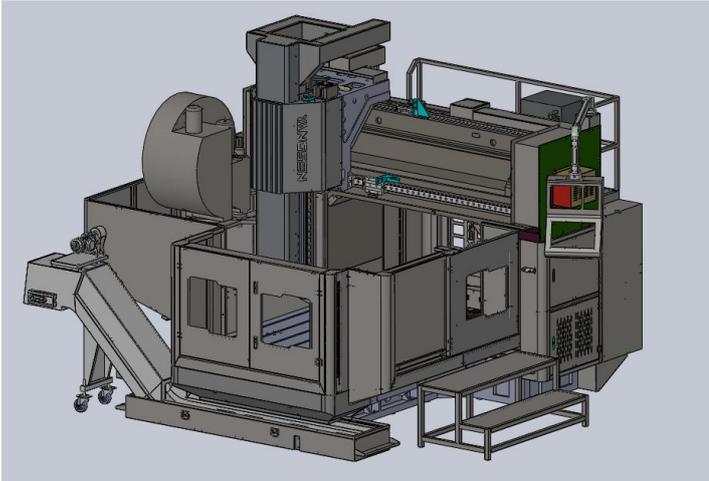
(Y Axis)

Axial movement of the ram

(Z Axis)

The picture is for reference only, the actual product shall prevail

## 2. Machine tool spindle



The main shaft motor is driven to the main shaft end through the main shaft coupling. The motor reduces the thermal deformation of the spindle through the constant temperature cooling method, which improves the stability of the spindle precision and the machining accuracy of the machine tool. The spindle group adopts Taiwan BBT50 high-rigidity spindle, ring-sprayed design, with high precision and high performance. The main shaft grabs the tool by the butterfly spring on the main shaft acting on the pull stud of the tool handle through the four-petal claw broach mechanism with the tension force. The machine tool has the functions of spindle orientation and rigid tapping.

The main shaft can be optionally equipped with a BF gearbox to achieve high and low speed changes through automatic shifting, and stepless speed regulation within each



speed.

## 2、Feed transmission of each axis

The X, Y, and Z transmissions all use AC servo motors as power sources, and ball screws as transmission components. The ball screw is fixedly supported at both ends, supported by imported special precision bearings and pre-stretched in two directions to ensure the feed rigidity and life of the screw. The Y-axis screw is equipped with an advanced auxiliary support structure, which can effectively avoid the accuracy error caused by the sag of the center of gravity of the large-stroke screw. The Z-axis motor has an automatic brake function. In the event of a power failure, the automatic brake will hold the motor shaft tightly so that it cannot rotate.

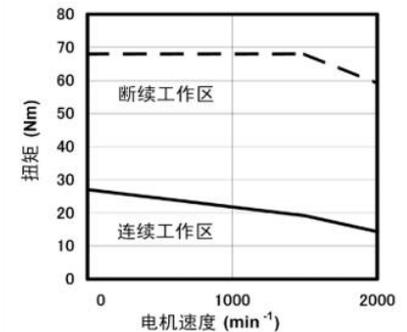
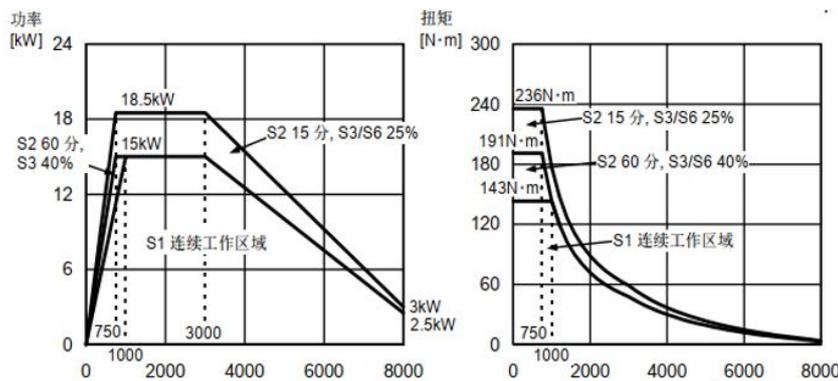
Triaxial and Spindle Torque

Charts:

系统	0i-MF Plus (5)	额定功率kW	额定扭矩N.m	最大扭矩N.m
X轴	$\beta iS$ 30/2000-B	3	27	68
Y轴	$\beta iS$ 30/2000-B	3	27	68
Z轴	$\beta iS$ 30/2000-B	3	27	68
主轴SP	$\beta iIP$ 30/8000-B	15	143	236

$\beta iIP$  30/8000-B

$\beta iS$  30/2000-B



3. Rail form

The X-axis guide rail pair adopts two heavy-duty linear guide rails, which have small friction coefficient and high sensitivity; small high-speed vibration and no crawling at low speed. The positioning accuracy of the drive shaft is high, and the servo drive performance is excellent; at the same time, the load capacity is large, and the cutting vibration resistance is good, which can improve the dynamic characteristics of the machine tool, improve the precision stability and service life of the machine tool;

The Y-axis beam guide pair adopts two heavy-duty linear guide rails; the guide rails are arranged in steps, with a large span, and sufficient bending rigidity and torsional rigidity.

The Z-axis guide rail pair adopts four heavy-duty linear guide rails and 8 sliders to ensure smooth cutting during processing.

4. Basic parts of machine tools

The bed, columns, beams, and spindle boxes are all cast with high-strength cast iron materials and resin sand technology. In order to meet the heavy-duty cutting of the machine tool, the cross-beam adopts a large cross-section, which has sufficient bending rigidity and torsional rigidity. These large pieces are designed with computer-assisted three-dimensional software, and the arrangement of ribs is reasonable to improve the rigidity of the large pieces.

5. Machine tool lubrication

There are two types of lubrication for machine tools: grease lubrication and automatic thin oil lubrication.

Grease lubrication part: Three coordinate bearings

Automatic thin oil lubrication parts: ball screw pair, linear guide rail, cast iron-friction guide rail pair composed of plastic paste

Automatic thin oil lubrication is a timing and quantitative automatic method, the action is automatically controlled by the numerical control system, and can detect and alarm

6. Cutting cooling chip removal system

The cutting cooling of the machine tool adopts the external cooling method, and the cooling liquid is

emulsified and non-corrosive liquid. The chip removal is sent to the trolley through the two-measuring chain plate chip removal machine on the bed.

**7. Machine tool protection device**

The bed guide rail (X-axis) of the machine tool adopts an anti-rust metal telescopic protective cover; the beam guide rail (Y-axis) adopts an organ-type protection; work in the environment.

**8. Electrical system**

This machine tool adopts the Japanese FANUC CNC system. The spindle drive unit, feed drive unit, AC spindle motor, and AC feed servo motor are all imported, with advanced performance, stability and reliability.

**9. Paint packaging**

The color of the machine tool shall be subject to the manufacturer's standard color standard. If the user has special requirements, specify the color requirements when signing the agreement. Machine tool packing box In addition to the electrical cabinet and machine tool accessories, which are packed in strong wooden boxes, the main engine of the machine tool is transported bare metal to ensure the installation cycle of the machine tool.

**10. Machine tool foundation**

The foundation must be a solid, rigid and smooth concrete foundation, and meet the requirements of the manufacturer's foundation drawings. The standard installation position of the equipment is ground installation, and the host and all related accessories are placed on the ground. If the factory building has height restrictions, The subsidence of the foundation can be selected and noted in the agreement, otherwise the default is not to sink.

11. The machine tool parts belong to the famous brand of famous factory, with top-level configuration.



**3. YSMV-1517 Main technical parameters of gantry CNC machining center**

Subject	Specification	unit	YSMV-1517
Travel	X/Y/Z axis	mm	1500*1700*800
	Spindle nose to the worktable surface	mm	90-890
	Gantry width	mm	1700
	Gantry Passable Height	mm	900
Worktable	worktable (L*W)	mm	1500*1400
	Worktable max load	t	6
	T-SLOT	mm	7-22*200
Spindle	Spindle, taper hole (model/installation size)	mm	BBT50
	Spindle speed	rpm	10000
	Spindle delivery type		DDS
Feed	Feed rate (X/Y/Z )	m/min	12-12-12
	The max cutting feed rate	mm/min	8000
ATC(optional)	Tool change method		Side Mount
	Tool Holder specifications	type	BT50
	Tool capacity	tools	24
	Maximum tool diameter (adjacent tool)	mm	φ112
	Maximum tool diameter (without adjacent tool)	mm	φ200
	Maximum tool length	mm	300
	Maximum tool weight	kg	15
	Fastest tool change time	sec	4.9
Motor	Spindle motor	kw	βiI12/12000
	x/y/z axis motor	kw	Bis30/2000/bis30/2000/bis30B/2000
	Cutting water pump motor	m/h-m	4-60
Accuracy GB/T 19362.2—2017	Positioning	mm	0.02/0.018/0.015
	Repeatability	mm	0.015/0.012/0.008
Power requirement	Power requirements	kva	45
	Air source requirements	Kg/cm	6~8
Others	L*W*H	mm	4092*4677*3941
	Weight	t	16



4. List of main purchased parts of gantry CNC machining center

No.	Product name	Qty	Manufacture	Specification
1	Controller	1 pcs	Japan Fanuc	FANUC-OI-MF
2	Electric spindle	1 pcs	Japan Fanuc	βiI12/12000
3	X, Y, Z servo motor	1set	Japan Fanuc	Bis30/2000/bis30/2000/bis30B/2000
4	Spindle bearing (Front)	1set	Japan KOYO	7018*3
5	Spindle bearing (Back)	1set	Japan KOYO	7018*2
6	X, Y, Z axis screw bearings	1set	Japan NSK	
7	X, Y, Z axis ball screw	1set	Japan THK	5010/5010/5010
8	X linear guide way	2pcs	Japan THK/INA	55
9	Y linear guide way	2 pcs	Japan THK/INA	55
10	Z linear guide way	4pcs	Japan THK/INA	45
11	Spindle unit	1set	YANGSEN	BBT50-φ190
12	Tool magazine (optional)	1 set	Okada	24T Disc Type
13	Cutting fluid pump	1set	YANGSEN	LDPB4V-60-1350W
14	Automatic lubrication system	1 set	Masakazu Japan /SKF	4L
15	Main pneumatic components	1set	Japan SMC	
16	Main electrical components	1set	Schneider	
17	Three-axis motor transmission mode and transmission ratio	1set	Japan NBK	
18	Electric cabinet air conditioner	1 set	Ouyi	
19	Chip removal device	1 set		Chain Plate
20	Oil Cooler	1 set	Rico	

Note : The manufacture preserves the rights to exchange parts at equivalent values.



5. YSMV-1517 Main accessories list

NO	Function	Specification	Quantity	Remark
1	Allen wrench	1.5---10	1 set	
2	screwdriver	word, cross	1 set	
3	raw tape		2 volumes	
4	glass glue	porcelain white	1 bottle	
5	Electronic handwheel		1pcs	
6	card reader		1pcs	
7	Memory card		1pcs	
8	cable	5 meters, 20 meters	2pcs	
9	snap ring		1pcs	
10	screw		1 package	
11	machine tool ground		1 stick	
12	Bellows connector		1pcs	
13	toolbox		1pcs	
14	foundation		1 set	
Accompanying documents				
1	Machining Center System Operation Manual	U disk	1 copy	
2	Certification		1 copy	
3	Packing List		1 copy	
4	Machine tool circuit diagram		1 copy	



## 6. YSMV-1517 Main function table of electrical system

### CNC System: Fanuc OI-MF

No.	Function	illustrate
1.	Number of control axes	5 axis
2.	Simultaneously control the number of axes	4 axis
3.	axis name	X, Y, Z, U, V, W, A, B, C any
4.	Minimum input unit	0.001mm
5.	Fine acceleration and deceleration control	
6.	High Response Vector Control	(Servo HRV3 control)
7.	Imperial/Metric Conversion	G20/G21
8.	interlock	
9.	emergency stop	
10.	Overtravel alarm	
11.	mirror image	G51.1, G50.1
12.	backlash compensation	Rapid traverse and cutting feed backlash compensation
13.	Stored pitch error compensation	
14.	automatic operation	
15.	DNC operation	
16.	MDI operation	
17.	program restart	
18.	single block	
19.	Manual continuous feed	
20.	Manual reference point return	
21.	Set reference point position without stopper	
22.	reference point offset	
23.	Rapid positioning	G00
24.	linear interpolation	G01
25.	Multi-quadrant circular interpolation	G02, G03
26.	Helical interpolation	
27.	Thread cutting, synchronous feed	
28.	pause	G04
29.	skip function	G31



No.	Function	illustrate
30.	Reference point return	G28
31.	Rapid feed rate	
32.	Rapid travel magnification	F0, 25, 50, 100%
33.	Automatic acceleration/deceleration	
34.	Feed speed override	
35.	JOG feed speed	
36.	the code	EIA RS244/ISO840 automatic identification
37.	logo skip	
38.	Control I/O	G15/G16
39.	Maximum Programmable Size	9 bits
40.	Absolute/Incremental Programming	O4 bit
41.	10 times input unit	N5 bit
42.	plane selection	G17, G18, G19
43.	Polar coordinate command	
44.	Coordinate system setting	G92
45.	Workpiece coordinate system	G52—G59
46.	manual absolute value	ON/OFF
47.	subroutine call	10 nested
48.	User Macro	
49.	fixed cycle	
50.	scaling	G50/G51
51.	Coordinate system rotation	G68/G69
52.	program format	
53.	program stop / program end	M00/M01/M02/M30
54.	Accessibility	
55.	High speed M/S/T/B interface	
56.	Spindle serial output	
57.	Spindle override	
58.	1st Spindle Orientation	
59.	Rigid tapping	
60.	M function	M2 digits
61.	S function	S4/S5 digits



No.	Function	illustrate
62.	T function	T2 digits
63.	Tool offset logarithm	400 pairs
64.	Tool offset memory C	
65.	Tool Length Compensation	G43, G44, G49
66.	Tool radius compensation C	
67.	Part program storage length	512K bytes
68.	program protection	
69.	Status Display	
70.	program display	
71.	Parameter setting and display	
72.	alarm display	
73.	Alarm history display	
74.	Operation history display	
75.	help function	
76.	display language	Simplified Chinese
77.	Display language dynamic switching	
78.	graphic display	
79.	data protection lock	
80.	Embedded Ethernet interface	
81.	memory card interface	
82.	Status output signal	
83.	setting and display unit	10.4" color LCD/MDI



6. Operating environment and testing requirements of YSMV-1517 gantry CNC machining center

1. Working environment of the machine tool

The working environment of the machine tool is directly related to the performance and normal operation of the machine tool. If the temperature is too high, the control mechanism in the numerical control system will fail or malfunction; if the temperature is too low, the working conditions of the lubrication system and hydraulic system will deteriorate and the machine tool will Faulty or damaged machine parts. Therefore, we recommend that the machine be used under the following conditions:

The temperature in the factory building can generally work normally in the temperature range of 0°C to 38°C, within this range, the error of the day should not exceed 5°C. Note: If the temperature in the factory building exceeds this range, the machining accuracy of the machine tool will be reduced.

The detected ambient temperature should comply with the provisions of GB1093-89.

Relative humidity<75%

The dust concentration in the air shall not exceed 10mg/m3, and shall not contain acid, salt and corrosive gas.

Atmospheric pressure 86 ~ 106kpa

The machine tool should be installed away from vibration and heat sources. The power in the workshop where the machine tool is installed should be below 0.5G (G is the acceleration of gravity).

2. Machine tool testing requirements

During machine tool inspection, the inspection instruments and inspection tools should be placed in the inspection environment for enough time to keep them in an isothermal state, and the influence of factors such as airflow, sunlight or external heat flow should also be avoided during inspection, and the ambient temperature for the evaluation of machine tool position accuracy 20°C shall prevail, but generally the following conditions shall be met.

Ambient temperature 0°C ~ 38°C.

The machine tool should be kept in the testing environment for no less than 12 hours before testing.

Any temperature gradient in the space occupied by the machine tool shall not exceed 0.5°C/h.

7. YSMV-1517 gantry CNC machining center installation, commissioning and acceptance training

1. The preparations before the machine tool installation that the user needs to carry out

Machine Tool Installation and Commissioning Preparation Form

Table with 2 columns: NO. and description of preparation steps. Includes steps for foundation preparation, power supply, and other tools.



<p><b>Confirmation of secondary grouting cement:</b></p> <p>Customers are requested to make a choice according to the actual situation, which is convenient for reasonable arrangements for installation and commissioning. The cement label is the old national standard, and the ambient temperature is required to be above 10°C.</p> <table border="1"> <thead> <tr> <th>Cement Grade.</th> <th>The maintenance time after the 2nd grouting</th> <th>The maintenance time after adding early strength agent</th> </tr> </thead> <tbody> <tr> <td>425#-500#</td> <td>Not less 30 days</td> <td>Not less 20 days</td> </tr> <tr> <td>600#</td> <td>Not less 20 days</td> <td>Not less 15 days</td> </tr> <tr> <td>800#</td> <td>Not less 15 days</td> <td>Not less 8-10 days</td> </tr> <tr> <td>Grouting Material</td> <td colspan="2">Not less 3-5 days</td> </tr> </tbody> </table> <p><b>Situation statement:</b></p> <p>Only when the above conditions are met, our company can go to make an adjustment. If the installation and commissioning conditions are not met, we will not be able to guarantee the progress of the installation and commissioning.</p>			Cement Grade.	The maintenance time after the 2nd grouting	The maintenance time after adding early strength agent	425#-500#	Not less 30 days	Not less 20 days	600#	Not less 20 days	Not less 15 days	800#	Not less 15 days	Not less 8-10 days	Grouting Material	Not less 3-5 days	
Cement Grade.	The maintenance time after the 2nd grouting	The maintenance time after adding early strength agent															
425#-500#	Not less 30 days	Not less 20 days															
600#	Not less 20 days	Not less 15 days															
800#	Not less 15 days	Not less 8-10 days															
Grouting Material	Not less 3-5 days																
<p><b>*Machine pre-installation conditions*</b></p>																	
6	The workshop where the machine tool is installed must be complete, and the foundation of the machine tool must be completed according to the requirements of the foundation plan.																
7	Unpacking tools, lifting equipment and hoisting ropes must be prepared.																
8	Preparation of consumables: anti-wear hydraulic oil ISO-L-HL46 (200 liters), precision guideway lubricating oil ISO-L-HG68 (10 liters), oil cooler ISO VG32 (60 liters), washing machine oil ( 50 liters), cleaning cloth, etc.																
9	Preparation of tools and slings: unpacking tools, lifting equipment and hoisting ropes (self-made by Party A)																
10	Inspection tool preparation: two spirit levels, a pair of equal-height measuring blocks, a square ruler L=1000mm, a dial indicator, a magnetic gauge base, a square gauge L≥500, and an inspection stick.																
11	There must be no equipment with large interference such as electric welding machines near the machine tool. If large interference will cause inaccurate positioning accuracy, coordinate drift or even machine tool crash for no reason.																
<p><b>*Materials to be confirmed before the machine leaves the factory*</b></p>																	
12	Road condition confirmation: Confirm the transportation method according to the factory building and surrounding road conditions.																
13	Factory door size: It needs to meet the net transportation size of the largest part of the machine tool.																
14	Plant height: The lifting method must be confirmed according to the actual height of the plant.																
15	Tonnage and number of cranes: a crane with more than 25 tons is required.																
16	Unpacking and installation assistants: the customer prepares unpacking tools for disassembly and inventory of the packing box.																
<p><b>*Customer's own special spreader list*</b></p>																	
17	Four legs complete set with hook cloth belt rope//5TX5M	1PCs															
18	Pressed galvanized steel wire rope is 6.5m long and can bear more than 20 tons	4PCs															
19	90mm diameter, 2.2m long round steel roller	2PCs															



20	Ring cloth belt rope sling//3TX3M	1PCs
21	Eye cloth strap rope sling//5TX5M	1PCs

If all items in this form are known and properly prepared, please send it to the manufacturer by fax as follows. If the confirmation has been completed but the above items are not implemented, the manufacturer will not be responsible for any problems caused. If there are special instructions, please indicate when returning.

### 2. Machine tool installation

Before the machine tool arrives at the destination, the user should make preparations for foundation installation and secondary grouting (after the contract is signed and becomes effective, the standard machine tool manufacturer is responsible for providing the foundation drawing within one month), so as not to have a major impact on the accuracy of the machine tool.

After the machine tool arrives at the destination, the user is responsible for unloading and lifting during installation and commissioning. After the machine is safely moved to the working position, the manufacturer is responsible for the initial adjustment, and the user performs the secondary grouting.

Before the commissioning personnel go, the user needs to complete the pre-installation preparations proposed by the manufacturer.

The user needs to notify the manufacturer two days in advance to carry out commissioning, and before the installation and commissioning, the user and the service personnel will unpack the box together, count according to the contract quantity and packing list, the user will carry out the construction according to the requirements of the foundation plan, lead the three-phase power line to the electrical cabinet, provide lifting equipment and cooperate with the manufacturer's installation and commissioning personnel;

After the installation and commissioning work is completed, the final acceptance of the machine tool is carried out.

### 3. Machine tool acceptance

Acceptance: carried out in the user's factory, Xiamen Jansen CNC Equipment Co., Ltd. will send personnel to carry out installation and commissioning, and the acceptance content will still be inspected according to the pre-acceptance content. After the final acceptance is passed, both parties will sign on the [NC installation and commissioning final acceptance work order];

Acceptance related matters:

The acceptance criteria refer to the technical agreement and the factory certificate. After passing the acceptance, the user will confirm and fill in the [CNC Installation and Commissioning Final Acceptance Worksheet]

The accuracy indicators of the machine tool are inspected according to the technical agreement and the accuracy inspection table of the certificate of conformity. Accuracy implementation standard:

GB/T19362.2-2017

### 4. Training

Teachers: 10 professional senior lecturers with rich theoretical and practical experience will train the students on machine tool operation and programming system, and the engineers of our company's technical department will explain the maintenance of the machine tool mechanical structure and electrical system to the students.

Training period: 3-5 days



Training location: Customers can choose to send operators to our company for training, or to conduct on-site training during machine tool installation and commissioning.

**9. YSMV-1517 Table of recommended oil and grease for gantry type CNC machining center**

Lubricating Part Name		Name	Oil Volume	Viscosity	Time Interval
Hydraulic Power Station	Tool cylinder	Hydraulic oil	200L	ISO VG46	1 Year
	Balance cylinder				
	Recommended Brand (optional)	SHELL TELLUS46 Great Wall: L-HM46 anti-wear hydraulic oil			
Constant Temperature Fuel Tank	Spindle group cooling	Hydraulic oil	60L	ISO VG32	1 Year
	Gearbox				
	Recommended Brand	SHELL TELLUS32 Great Wall: L-HM32 anti-wear hydraulic oil			
Centralized Lubrication	Three-axis lead screw lubrication and line rail, sliding guide rail	Rail Oil	10L	ISO VG68	Oil supply every 30min
	Recommended Brand	SHELL TONNA T68			
		Great Wall: L-G68 rail oil			
Tool Magazine Lubrication		Rail lubricating oil	Please refer to the magazine manual	ISO VG 150	PCs, according to the actual oil level alarm signal supply

If all items in this form are known and properly prepared, please send it to the manufacturer by fax as follows. If the confirmation has been completed but the above items are not implemented, the manufacturer will not be responsible for any problems caused. If there are special instructions, please indicate when returning.



## **10. Xiamen Yangsen NC Equipment After-sales Commitment Letter**

1. Pre-sales service: Janssen's sales team will provide users with the best processing solutions, including machine tool selection, option configuration, tool and fixture selection, lubricating oil, cutting fluid management and other series of services. And can provide turnkey projects.
2. Maintenance response time: Our company has a service team of up to 50 people and is equipped with a complete service vehicle. After receiving the user's notification of failure, we will respond within 8 hours.
3. Parts inventory: Janssen has a special production workshop and parts inventory in Xiamen, with strong strength and complete inventory. There are commonly used parts inventories in each office to provide users with the fastest repair parts.
4. Machine tool maintenance: All machine tools within the warranty period enjoy free maintenance services, and machine tools outside the warranty period can purchase maintenance services at an economical and reasonable price. And PCs can plan equipment management and maintenance processes according to customer needs.
5. Maintenance charges after the warranty period: The charging standard is clearly marked and the real price is charged, only the cost is charged, and the user is served with the concept of openness, fairness and fairness. After the maintenance period, our company is responsible for providing spare parts at preferential prices for a long time, and the maintenance service fee time is not more than 48 hours;
6. Ad hoc old user service department: closely track the use of machine tools, and deal with maintenance complaints in a timely manner.
7. Maintenance supervision: the general manager also serves as the director of the after-sales service department, supervises the quality of maintenance services in real time, and protects the rights of customers.
8. Warranty: From the date of acceptance of the equipment, a one-year warranty period is provided. During the warranty period, our company is responsible for free maintenance for equipment failures caused by users. If the fault is caused by improper use by the user, the cost fee will be charged after the service.

## **Xiamen Yangsen NC Equipment Co., Ltd**

The company's products are constantly being developed and improved, and specifications may be changed without notice. Some images in this document may contain optional items.

The pictures in this document are for reference only, and the actual product shall prevail.