

Instruction manual

Installation Manual

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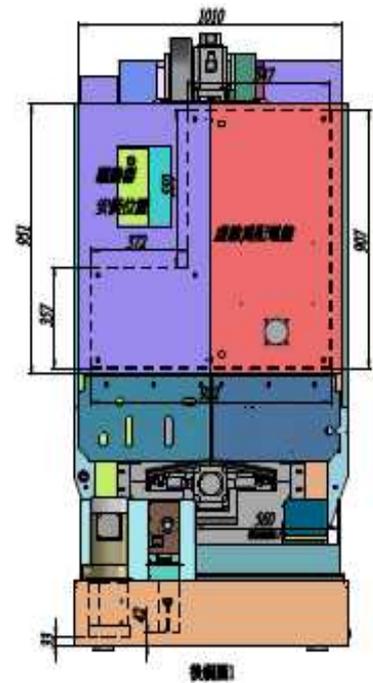
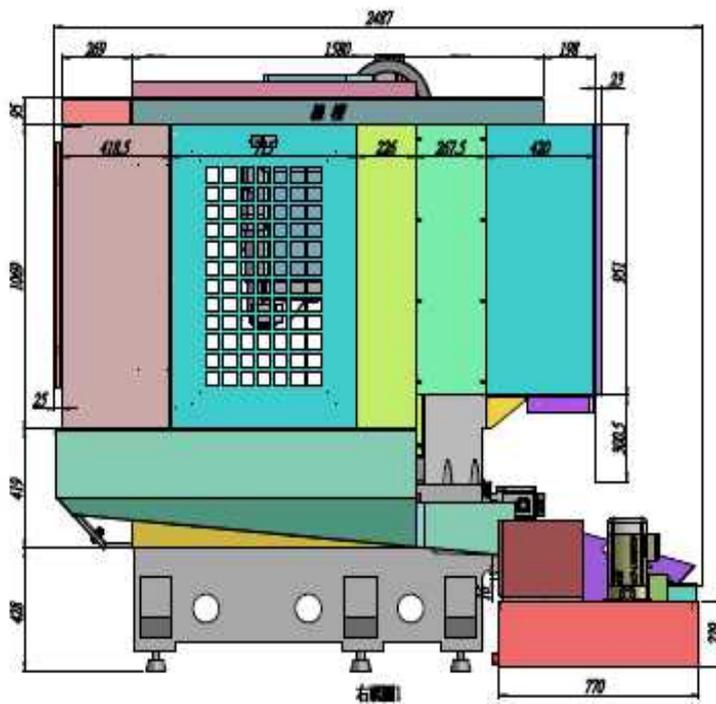
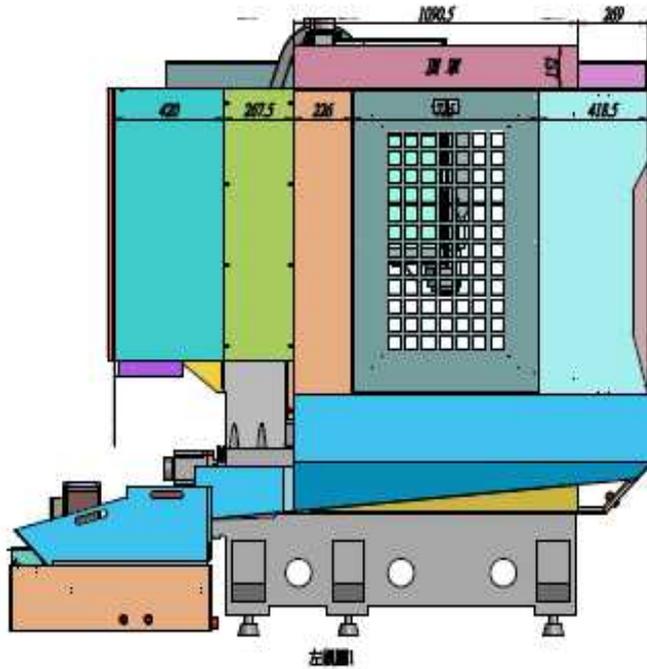
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1. Technical Specification of the Machine Tool

1.1 Machine Tool Layout

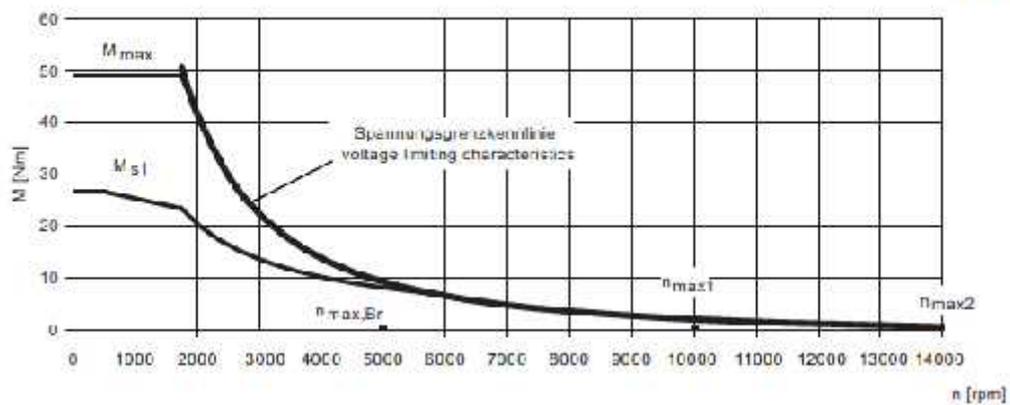
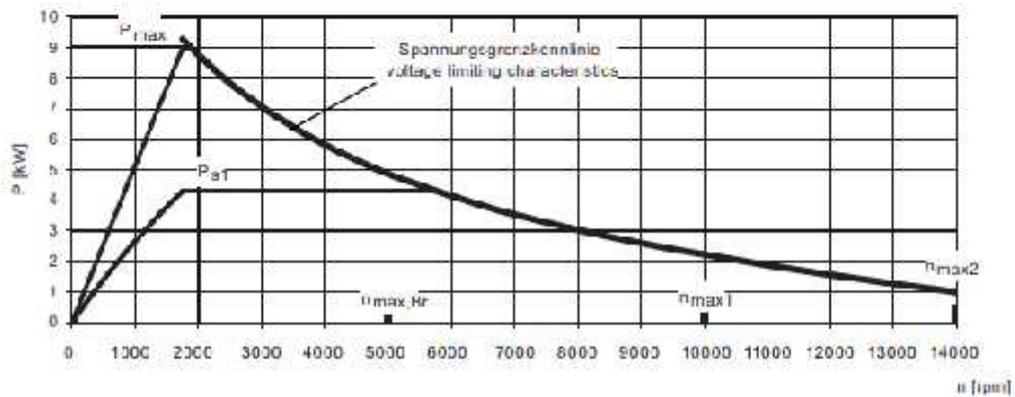


1.2 Technical Specification

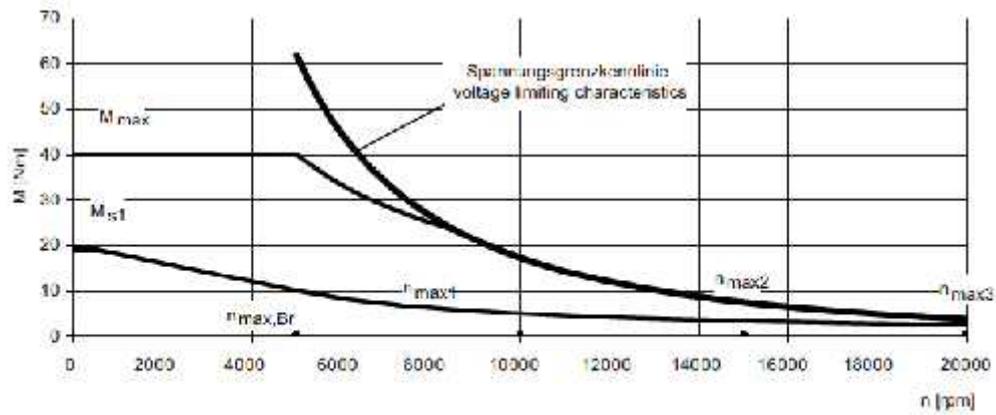
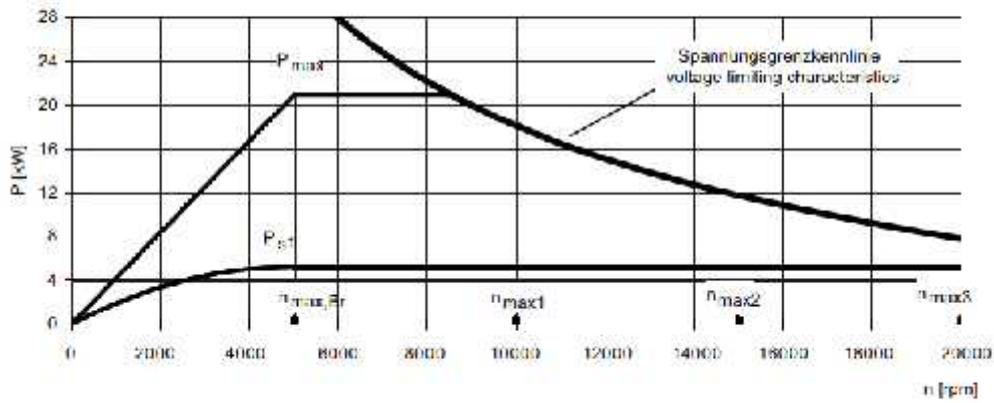
1	Effective dimension of working bench (Length x Width)		620mm×400mm
2	Width of T-shaped Groove		14mm
3	Maximum load capacity of the working bench		250kg
4	Stroke of X-spindle		300mm
5	Stroke of Y-spindle		400mm
6	Stroke of Z-spindle		330mm
7	Specification of main spindle		BT30
8	Rotation speed of the main spindle		10000rpm/20000rpm
9	Power of main spindle motor		4.8kw
10	Feeding motor	Torque/power of x-spindle	6Nm/1.5kw
		Torque/power of y-spindle	6Nm/1.5kw
		Torque/power of z-spindle	11Nm/2.3kw
11	Maximum feeding speed		48000mm/min
12	Screw road parameter (diameter/thread pitch)	XY	25mm/16mm
		Z	25mm/16mm
13	Width of Wire Rail	XY	25mm
		Z	30mm
14	Precision	Positioning Precision	0.005mm
		Repeated Positioning Precision	0.003mm
15	Tool Storeroom	Tool Quantity	16
		Tool Switching Time	1.7s
16	Air Pressure		0.5
17	Machine Weight	Net Weight	800kg
		Gross Weight	1300kg
18	Machine dimension: Length x Width x Height (mm)	Bare Machine	830mm×1000mm×1800mm
		Complete machine	1900mm×1400mm×2100mm

1.3 Main Spindle Rotation Speed –Power Chart

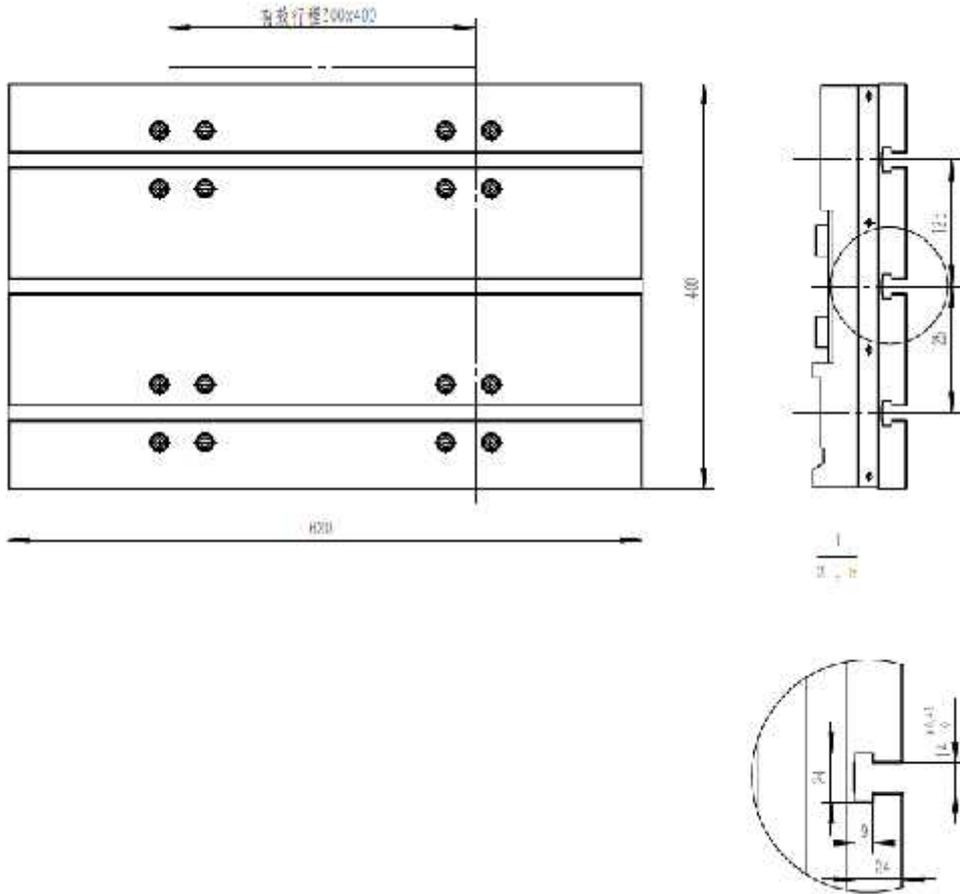
n_N [rpm]	P_N [kW]	M_N [Nm]	I_N [A]	n_{max1} [rpm]	n_{max2} [rpm]	n_{max3} [rpm]	$n_{max,Br}$ [rpm]	n_2 [rpm]	M_{max} [Nm]	I_{max} [A]	M_0 [Nm]	I_0 [A]
1750	4.3	23	10.0	10000	14000	-	5000	5850	49	20	27	11
1500	3.7	24	10.0					6750				



n_N [rpm]	P_N [kW]	M_N [Nm]	I_N [A]	n_{max1} [rpm]	n_{max2} [rpm]	n_{max3} [rpm]	$n_{max,Br}$ [rpm]	n_2 [rpm]	M_{max} [Nm]	I_{max} [A]	M_0 [Nm]	I_0 [A]
5000	5.3	10	17.0	10000	15000	20000	5000	20000	40	41	19	23
4500	4.8	10	17.0					20000				



1.4 Dimension



2. Transportation and Installation

2.1 Installation Conditions and Environment



1. Before the installation of the machine tool, it is necessary to fully read and understand the safety instructions in this manual.
2. During the installation, please ensure the ground is free of lubricating grease and water to avoid the falling off of the installation personnel.
3. Before operation, please check the correct installation of the machine tool.

1. Installation Conditions

- 1) Below environments are quite suitable for the installation of the machine tool:
- The environment that would not have condensation or dew formation due to changes in temperature.
 - The surface is flat and nonslip.
 - The public facilities have been stably supplied and maintained.
 - The environment is convenient for adjustment of the machine tool.
 - There is no fire or explosion risk in the environment.
- 2) Below installation environments should be avoided:
- Environment with direct sunshine, close to heat source and high temperature difference
 - Excessive amount of dust or high humidity
 - Environment close to vibrating machine
 - Soft foundation
 - The ground is not flat or too slippery

 小心 Caution!

- Silencers should be installed on the surrounding areas of the machine tool if there are any vibrating machines around the machine tool.
- In case any special components have been selected to install on the machine tool, please guarantee sufficient space for maintenance.

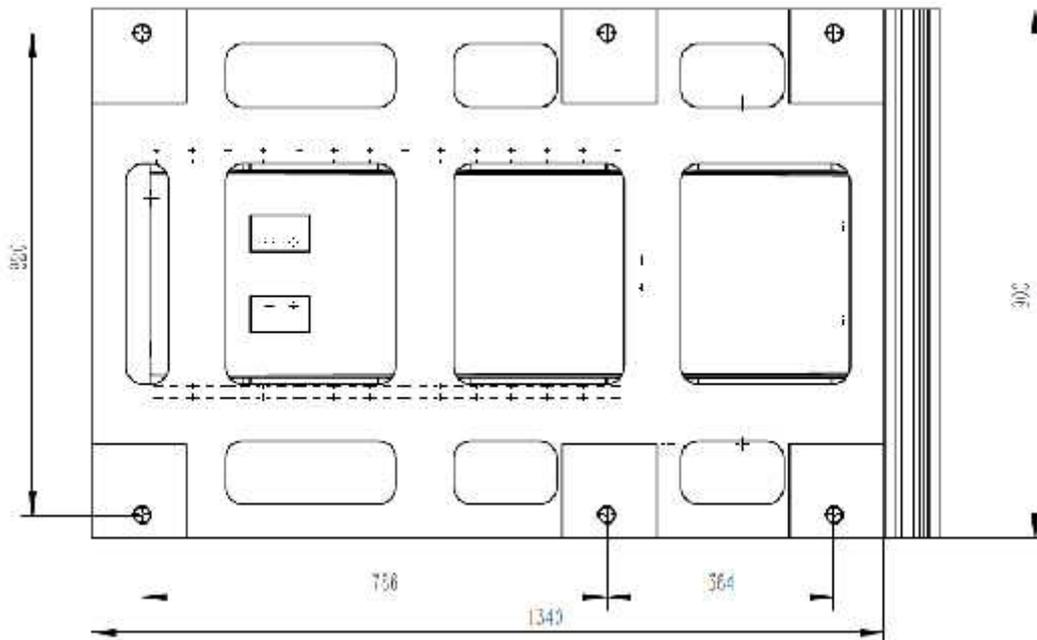
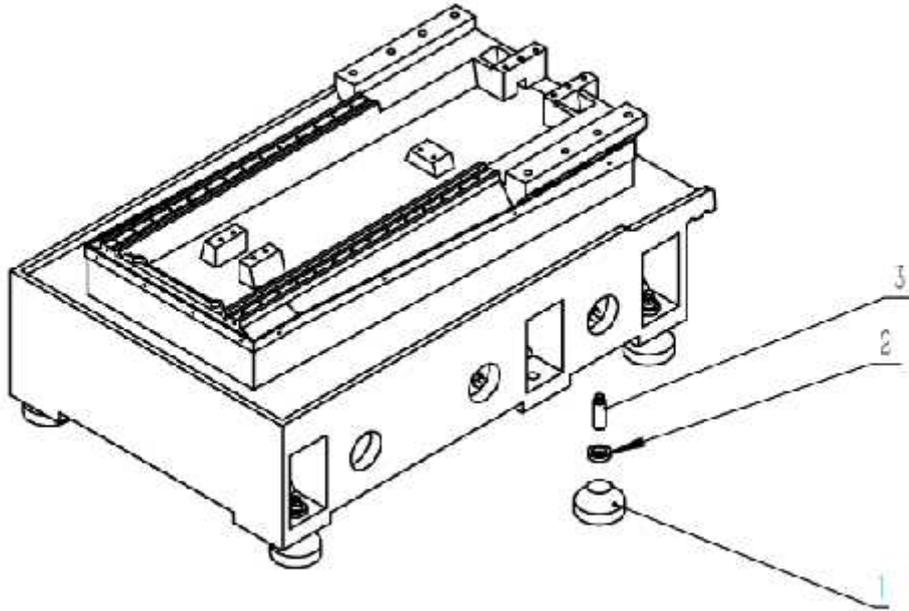
2. Installation Environment

Category	Contents
Temperature	Should be maintained at the level between 0°C and 45°C
Relative Humidity	The relative humidity should be maintained at the level between 10% and 75%
Space	The space of no less than 600mm should be maintained around the machine tool for the convenience of repair and maintenance
Lighting	The lighting device should have the illumination no less than 300lux
Degree of Purity	High that grade 100
Noise	Less than 70db
Storage Temperature	-20~+65°C

 小心 Caution!

Air source with air drier should be installed because excessive humidity would damage the machine tool.

2.1.1 Positions of Anchor Bolts



2.2 Transportation

2.2.1 Description

1. The machine tool is constituted by two types of main components including the machine body and control device. Besides, all devices should be installed on the machine body. The assembled machine tool could be moved to the required position.
2. The machine tool could be moved with two methods, including crane and forklift.



- Please do not lift up any other articles during the transportation of the machine tool.
- Please do not under the lifted machine.
- During the transportation of the machine tool, please pay attention to your body to avoid getting struck.



- Before the transportation of the machine tool, check whether various components of the machine tool are correctly installed.
- The machine should be lifted up slowly to guarantee complete balance of the machine tool.
- Please ensure the machine body, electrical control panel and other electrical equipment would not suffer any vibration.
- The box for cooling agent should be separated from the machine tool before transportation.
- Please check and ensure the loaded machine tool would not hinder the transportation before the commencement of the transportation. If any there is no sufficient space for the loading of the machine tool, please contact person-in-charge of the factory to adjust the machine tool or take other measures to guarantee the safe transportation. In case the machine tool is

not moved, please remind the working personnel to pay attention to working safety.

2.2.2 Transportation with Crane

1. When transport the machine tool with crane, please ensure the achievement of below points:

- 1) Adjust the central position through moving the vehicle base and horizontal supporting plate to ensure the machine tool would be loaded on the central position of overhanging angle.
- 2) The angle of steel cable should be controlled at the level within 90° .
If possible, adjust the angle to 60° .
- 3) Installation position of steel cable
 - A. Two sides of the pedestal
 - B. Fixing device for transportation

小心 Caution!

1. Slowly lift up the machine, check the balance of the machine in various directions and guarantee that the rope could contact with external casing or other components.
2. If the machine is lifted up by two persons, they should communicate with each other and impose force simultaneously.
3. Please do not use steel ropes with insufficient length or rusted steel ropes.
4. The machine should be lifted up slowly. After the steel rope has reached its tension force, please temporarily stop the lifting and check the status of the machine tool before lifting the machine to the designated height.
5. The lowering of the machine should be performed slowly. Please stop the lowering temporarily and check the positions of the machine before it reaches the ground. After the checking, place down the machine completely.
6. The lifting work should only be completed by personnel with sufficient experience.

2.2.3 Transportation Method with Forklift

- Please fully read and understand the safety instructions of the manual before the installation of the machine tool.
- During the installation of the machine, please guarantee the ground is free of lubricating grease or water to avoid the falling off of installation personnel.
- Before the work, please check and confirm whether the machine tool has been installed to the correct position.

小心 Caution

1. Only personnel with operation qualification of forklift could use forklift to transport the machine tool.
2. In order to avoid the damage of any places on surrounding areas of the extruded components of the machine tool, the forklift transportation vehicle should be operated by two persons.
3. Slowly lower down the machine tool and please ensure the machine tool would not collide with the ground.
4. Wooden plate could be used between the machine tool and forklift in the lifting process.

2.3 Disassembly and Cleaning of Fixing Device

For safety consideration, please use fixing device to fix various spindles during the transportation process.



It is highly prohibited to operate the machine tool before dismantling the fixing device.

小心 Caution!

严禁使用油或可能引起燃烧的各种化学物质，谨慎用火。

It is highly prohibited to use any oil or other chemical materials that may result in fire accidents. Please be careful with fire.

3. Levelling and Electrical Device

3.1 Horizontal Adjustment

1. Horizontal adjustment method is one of the factors influencing the precision of the machine tool.
2. Horizontal adjustment of machine tool is one of the most basic works that would influence the machining precision of work piece and the service life of the machine tool.
3. Perform horizontal adjustment in below sequence:
 - 1) First, place the horizontal adjustment seat on the installation position at the bottom. The installation of the machine tool should be able to position the adjustment bolt (positioning bolts) of the machine.
 - 2) Lift up the subsequent spirit level and the fixture of spirit level on the bench.
 - 3) Adjust the horizontal errors to ensure the direction of front and back error is within 0.04mm/m.
 - 4) Use appropriate spirit level, and the sensitivity of unit scale should be 0.02mm/m.
 - 5) Operate the level gauges used to ensure they are in same direction.

小心·Caution!

1. Please keep the contacting surface of level gauge clean to prevent any dirt like dust from entering into the level gauge during the measurement process.
2. Considering the moving property, the tilting or abrasion of the machine body may cause horizontal loss of control of the machine tool, which would further result in fault of the machine tool.
3. During the moving of level gauge, please ensure it would not have any interference with chuck or tailstock.
4. Use the firmly installed anchor bolts and nuts to make the final horizontal adjustment.
5. Upon the completion of the installation, please perform horizontal adjustment according to below instructions.

Adjustment Cycle	Cycle
Two to three days after the installation of the machine tool	Each day
Within 6 months after the installation of the machine tool	Each month
After six months	Each quarter

3.2 Power Supply and Wiring

3.2.1 Grounding

 **WARNING**

The grounding operation could only be performed by chartered engineer. Otherwise, below consequences may be caused:

1. After the installation, all electrical facilities should be grounded according to the technical specification to avoid human injuries and faulty operation of the machine.
2. The grounding point should be close to the machine. Moreover, separate wiring should be arranged.
3. Only authorized engineers could perform the class III grounding operation:
 - Grounding resistance: less than 100
 - Please refer to the table for the requirement of the cable
 - Measurement equipment: 500v high resistance tester

Cross-section of Power Cord mm ²	Minimum Cross-section of Grounding Wire mm ²
S 16	S
16 < S 35	16
S > 35	S/2

Grounding Method

A. Ground separately.

B. Common ground:

The grounding wire of each machine tool should connect on its corresponding grounding terminal and one terminal only has one grounding wire.

Grounding resistance = 100/quantity of machine tool

C. It is highly prohibited to ground the machine in series.

3.2.2 Check the Power Supply

The delivery of the equipment should observe strict QC standard. Due to the vibration and

temperature change in the long time transportation process, however, the machine may not be 100% complete before handover. Before the power connection, the installation personnel of the equipment should perform below checks before switching on the power supply.

1. Checking before Power Connection

- 1) Check the assembly status of various components on the controller panel (looseness of components).
- 2) Check the assembly status of the control panel and connectors on devices.
- 3) Check whether the wire connection on wiring board is tight and tighten them if necessary.
- 4) Check the current value setting of breaker to protect the motor.
- 5) Check whether the connectors on control panel have been tightened.
- 6) Check the perfect status of the general connection of other motors, the signal connectors of server motor/main spindle motor and power connectors.
- 7) Check the connection section of the hose connector of the machine tool.

3.2.3 Checking before Operation

1. Before operation, please read the installation and operation manual provided by our company and perform the operation according to the instructions.

2. For safety operation consideration, only employees passing basic operation training could operate the machine.

3. After connection of the power supply, check the electricity leakage status of the main components of the machine after the normal lubricating status of the lubrication system under normal running status of the machine tool.

3.2.4 Connect the Main Power Supply

1. Power Switch

The other machine tool with independent power switch should be installed at the place easy for opening or closing.

2. Replace Electrical Device according to the Voltage and Frequency Requirements

It is necessary to change the setting of electrical application according to the voltage and frequency of the power supply in the factory. Please check the voltage and frequency before

the changing.



Serious fluctuations of voltage may result in abnormal running of the machine tool or fault of the electrical components.

Under such situations, external transformer or voltage stabilizer may be installed to solve the problem.



The equipment that may generate high frequency noises (like welding machine, high frequency drier, anti-electricity treatment machine and so forth) should use independent distribution board or install other distribution board with more than 20m away from the machine tool.



Water stabilizing equipment should be used if the voltage is beyond the allowable range or the voltage has excessive fluctuations. In case equipment like welding machine is connected with the power line, excessive noises resulting from such equipment may cause fault of machine tool. In such cases, it is necessary to remove such equipment from the power line of the machine tool.

3. Power Cord Connection

Before the installation and operation of the machine, please read below instructions and complete relative work.

After the proper installation of the equipment, connect the power cord and check the main power switch. Connect the grounding wire and then connect them in the sequence of L01, L02 and L03. For power cord in reversed direction, check whether the three-phase voltage and the setting values of the voltage could meet the requirements of the power inlet of the user facilities. After the confirmation, connect the wire to the breaker in the sequence of PE, L11, L12 and L13. During such connection, the power supply of the distribution board should be disconnected.

Connection sequence of the power supply of the machine tool:

Turn on the breaker of the distribution board Switch on the main power switch Turn on the power switch on the operation panel



Please check the grounding wire (PE) once per each six months.

If the machine tool needs to be moved, please check the grounding line (PE) in advance.