INSTRUCTION MANUAL

VERTICL MACHINE CENTER

MODE :V 1100 \V1360

:

LEADERWAY CNC TECHNOLOGIES
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1-GENERAL

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Preface

- Safety is the first of all ! We do not product machines but care about you very much.
- We are pleased to know that you have decided to purchase our CNC machine tool center. We are sure this machine, after operating on the production line of your factory, will be able to promote your products of high stability and excellent quality.
- It is our pleasure to introduce the relevant information regarding the safe use of this machine and help you increase the production capability and operating this machine in proper way can not only keep it at high precision and stable condition but also keep you from damage or danger.
- Before using this machine, please be sure to read all of the Operation Manual, Mechanical Manual and the safety regulations very carefully so as to ensure the safety for the people and the machinery.
- Please put Manuals available around for the operator easy to get, do not put them away. Do not damage it and make good use of them to ensure your safety. Therefore, please good use of your experience, common sense and Manuals instruction to remind you. When train your employees always think safety is the first of all for all kinds of industries and job.
- We have put our efforts on offering safety and excellent machinery for our customers in order to restore the normal operation and upgrade the technical standard of our factory. Please feel free and take down what have happened in detail and inform our factory or the nearest agent, service center to handle it for you.

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⚠ DANGER

Be careful, if the dangerous or hazardous things happen will easy to cause personnel death and heavy injury.

⚠ WARNING

Be careful, if the warning things occur might cause people die or heavy injury.

⚠ CAUTION

If the dangerous things occur will cause people injured or product damaged.

- Labels：Indicated some special purpose or production examined by Q.C. dep.

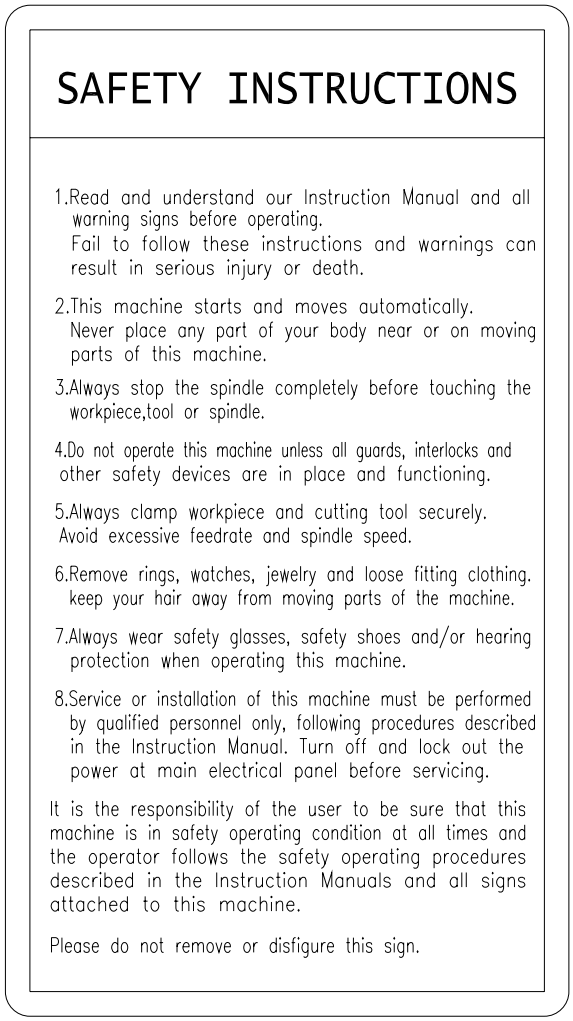
Make sure that you can read all warning and instruction labels. Clean or replace these labels if you cannot read the words or see the pictures. By using a cloth, water and soap to clean them. Do not use solvent, gasoline or unknown solution. You must replace new labels if they are broke, missing or cannot be recognized. In addition to the information given on safety labels, there is a variety of other cautionary information which must be observed by operators during machine installation, operating and maintenance.

- Read all safety-related information carefully
- Failure to observe the danger of caution information can lead operators to serious injury or damage to the machine. Always observe this information during machine installation, operation and maintenance
- The health and safety measures applied to the machine are in conformance with the following European standards:
  - EN 292-1
  - EN 292-2
  - EN 294
  - EN 349
  - EN 418
  - EN 1050
  - ENV 1070
- The electrical equipment is in conformance EN 60204 standard.

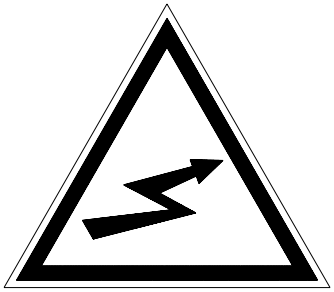
Cautions on warning labels

The warning labels show in the table below are attached to this machine.

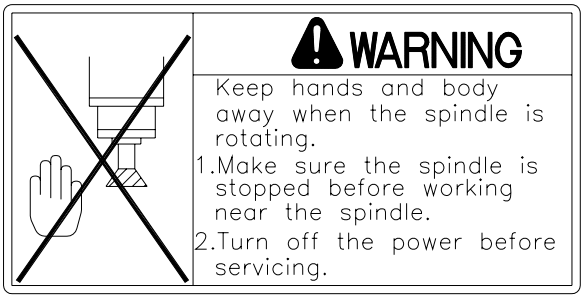
Fully the contents of each warning label and observe the mentioned items.




WARNING
EXPOSED SCREW AND
MOVING PARTS CAN
CAUSE SEVERE INJURY
LOCK OUT POWER
BEFORE REMOVING
COVER OR SERVICING




REQUIREMENT:
1.AIR PRESSURE: 6 bar
氣壓源需求 :
使用壓力 : 6 bar
2.COMPRESSED AIR MUST BE
VERY DRY AND CLEAN
BEFORE SUPPLY TO MACHINE
OTHERWISE THE RELATED
PARTS WILL BE SERIOUSLY
DAMAGED.
壓縮空氣必須是乾淨且乾燥的,
水份及雜物進入會損壞機械元件


WARNING
Keep hands and body
away when the spindle is
rotating.
1.Make sure the spindle is
stopped before working
near the spindle.
2.Turn off the power before
servicing.

Safety

This machine is provided with a number of safety devices to protect personnel and equipment from injury and damage. Operators should not rely solely upon these safety devices but should operate the machine after fully understanding what special precautions to take by reading the following statements thoroughly.

Safety precautions

However, safe operation cannot be ensured if operators use a CNC Machine Center improperly or do not follow safety rules properly. Failure to comply with these rules may result in death, injury or damage to the machine and/or products.

The basic conditions given below must always be strictly followed.

- Only qualified or trained personnel are permitted to maintain and/or operate th machine.
- Read the instruction manual thoroughly and make sure the contents complete understand in order to operate a machine efficiently and safely.
- Always keep this safety paragraph and instruction manual at a designated pla near the machine so that they can be easily accessed whenever required.
- Use safety shoes, which are not damaged by oil, safety goggles with sic covers, safety clothes and other relevant safety protection.
- The key of key-switch must keep by the senior and qualified personnel.
- Be sure there are no articles or material around the machine.
- A series machines start-up requires a PC with V24 interface for data transf from/to the control system and an NC card. On the PC, WINPCIN Tool must b used.
- Turn off the power source before going home, checking machine.
- An internal data backup must be carried out whenever the control system switched off longer than 50 hours.
- The NC card must be plugged or removed only when the PC is turned off.
- All persons concern with operation and maintenance of this machine must b aware of the emergency stop button and switch location, function and operatio
- In the event power is failure, turn off the main circuit breaker immediately.
- Use the recommended hydraulic oil, lubricants and grease or acceptab equivalents.
- Replacement fuses should have the proper current ratings.
- Protect the NC system, operating panel, etc., from shocks, because of resulting failure or malfunction.
- Do not change parameters, volumes and other electrical setting unnecessarily. If such change is unavoidable, record the values prior the change so that they can be returned to their original setting if necessary.

- Do not soil, scratch or remove the caution plates.
- Whenever operating forklift truck, crane or similar equipment, special car should be taken to prevent collisions and damage to surroundings.

Before of operating machine

- Check the power source of factory is fit for requirement.
- Check motors and other parts for abnormal noises.
- Check pressure gauge for proper readings.
- Check the lubrication motor, sliding parts for evidence of proper lubricant.
- The first time to operate the machine, after unpacking or keeping the machine idle for a long period each slide way surface must be freshly lubricated. Keep lubrication pump work till oil oozes out from wiper. Contact our service station or agents in connection with what procedure should be taken since it depends on the type of machine.
- Clean machine so that any abnormalities can be found.
- Make sure the lubrication oil pressure; pneumatic pressure and hydraulic pressure indicate the correct values.
- Make sure the lubrication oil is properly supplied to the correct places.
- Check joints or fasteners of pipe, hose, wire and cable there are any leakage or loose.
- Check coolant tank and oil reservoir are filled to indicated level or refill them, if necessary.
- It is safe that all parts, chips and waste oil should be removed by the operator and be placed to assigned storehouse and far from machine.
- Ensure the hoisting rope, transportation blocks and packing stuff are remove completely before starting running the machine.

Warm up and preparation

- The power cable from the factory feeder switch to the machine main circuit breaker check if there is a sufficient sectional area to handle the electric power usage.
- Warm up the machine include NC unit or PC connection, especially the spindle and feed shaft by running 10- 20 minutes at ball part half or one-third the maximum speed in the automatic operation mode.
- Wire rope or slings should be strong enough to stand the load of lifting and should be conform to the mandatory provisions.
- Tooling should conform to the machine specifications, dimensions and type.
- After installing a tool into spindle, make a trial run.
- Make trial run of ATC system, rate of feed axes, motor rotating and the basic function of operation panel.

⚠ WARNING

Do not rotate spindle unless the tool holder load into spindle already

Caution of operating machine

- Always wear helmet, protecting glasses, safety shoes and other protecting equipments as required while operating machine.
- The operations of this machine should not against the instruction of all manuals.
- Do not settle down the machine near high electrical magnetic interference (EMI) machine
- Do not wear loose clothing or jewel that can be caught by moving parts of machine.
- Do not touch the chips and blade tip of the cutter with naked fingers.
- During operation, do not take the chips away or touch the rotating portion parts with naked fingers or other articles.
- When performing heavy-duty machining, prevent carefully chips from being accumulated since hot chips can catch fire.
- Before any rotation parts, moving articles or transmission feed stop completely, do not touch the cutter or work pieces.
- Do not touches or press the buttons and switches with wet hands it might get shock.
- Do not operate switches with gloves on, it will cause malfunction, etc..
- Always remember the location of emergency stop button so that you can press the buttons right away if any unexpected accidence is occurred
- Never operate the machine or turn on the power source unless everything is completely set down and inspected all right.
- Do not use fuses other than those specified or change parts for the sake of saving money.

- Pay attention to and keep away from the high voltage devices or isolate with cover.
- Stop machine before maintaining or adjusting the position of coolant hose, cutter or disposing the chips
- Cables, cords or electric wire whose insulation is damaged can produce current leaks and electric shocks. Before using check their condition.
- Do not cut a kind of material, which are easy to catch fire on the machine, such as magnesium, magnesium ally or other material, which lower melting point.
- Do not open the door or remove the covers of chip proof sheet metal, during machine performance.
- Do not open the power cabinet door while the machine is operating. If it's necessary to open it, be sure the machine stops running totally.

Operator requirement

- User's occupation
- Any manufacturing company/factory which does milling, drilling, boring tapping process for metal or non-mental materials.
- Education requirement
- Any person who was graduates from junior high school acknowledges the English capital, has the logic concept of mathematics, and knows how to operate control keys, is qualified to learn and manipulate this machine. Either man or women do for this job

Material witch can be processed

- Metal: Iron, Steel, Aluminum, Titanium, stainless, alloy.
- Non-metal: Plastics, Wood, Fiber, Polymer, Acryl.

Check before Power On

Please make sure to do every check before operation each time. This can ensure operator's safe usage and machine's normal work.

Before power on machine, please check if the wires and cables are damaged in case of electric accident. Make sure that the wires and cables are not damaged. Otherwise, it may happen electric leakage and cause serious casualties.

Checking procedure

Check Point	Check Item	Method	Remark
・Filter, Regulator & Lubricator Unit	1. Have water in the filter cup been dried out? 2. Is there enough oil in the oil cup? 3. Is there enough compressible air pressure?	By eye	
・Spindle Oil Cooler	1. Check if there's enough lubricant inside the spindle head. 2. Check if the joints of oil tubes are locked tightly.	By eye By hand	
・Coolant Tank ・Chip Conveyor	1. Check if the chips are cleaned. 2. Check if there's enough coolant in the tank. 3. Check if the joints of tubes are locked tightly. 4. 4. Check if the joints of cables are locked tightly.	By eye By hand By hand	
・Coolant tank of right/left side	1. Check if the chips are cleaned. 2. Check if other items are put inside.	By eyes	
・Telescopic Covers	1. Check if there are chips on it. 2. Check if there is proper quantity of Lubricant on its face.	By eye	
・ATC door	1. Check if the chips are cleaned.	By eye	
・Table	1. Check if the chips are cleaned.	By eye	
・Spindle	1. Check if spindle taper is clean.	By eye	
・Electric Cabinet ・Operation Cabinet	1. Check if the controller units and joints are fixed. 2. Check if the door is locked well.	By hand	

Check Point	Check Item	Method	Remark
・Each ground wires.	1. Check if terminal of ground wires are locked tightly.	By hand	
・Junction Box of ATC, Base and Spindle head…etc.	1. Check if terminal screws and joints are locked tightly. 2. Check if the cover of Junction Box is locked tight.	By hand	
・Machine's surroundings	1. Check if the machines' bolts are locked tightly. 2. Is the machine's surrounding clean?	By hand By eye	

Check after power on machine

Check Point	Check Item	Method	Remark
・Motor	1. Is there any strange sound? 2. Does it overheat?	By eye and ear	
・Pneumatic system	1. Press enough(5-7kg/c ㎡) 2. Do the pipes leak?	By eye	
・Spindle Oil Cooler	1. Is the temperature setting correct?	By eye	
・LCD Screen	1. Does it show alarm message?	By eye	
・Operational Panel	1. Does alarm lamp light?	By eye	
・Chip Conveyor ・Chip Auger	1. Clockwise rotate correctly. 2. Counter-clockwise rotate correctly.	By eyes	
・Coolant Pump	1. Pump work normally. 2. 2. Pipes are not leaking.	By eye	

Check of Manual Operation

Item	Description	Result
1.	Can each axis go positive position? Negative Position?	□ Normal □ Abnormal
2.	Does each axis have protection of over-travel? Positive direction? Negative direction?	□ Normal □ Abnormal
3.	Does each axis go back to reference positions?	□ Normal □ Abnormal
4.	What is the spindle's rotate direction? Can the spindle orientation ? Stop ? Clamp/Unclamp ?	□ Normal □ Abnormal
5.	Does Tool Magazine clockwise or Counter-clockwise ?	□ Normal □ Abnormal

Machine life

Machine life limits

- Under normal operating and with well maintenance. The intended life of this machine. About count by:
  - 8 hours x 5 days x 4 weeks x 12 months x 10years = 19200 hours
- There are many warning signs on the machine, please should be obeyed. In addition to the waning signs, please should be obeyed the safety precautions of the instruction manual.
- Only a skilled person is allowed to operate this machine. Otherwise, the person must be trained until he know how to operate the machine safety and efficiently.

Guarantee

- One year's life is guarantee for any components in the machine.
  - Key components – one year's life is guarantee
  - Spindle unit and bearing.
  - linear guide ways
  - ball screws and bearing
  - Control unit, main motor and servo motor.
  - ATC unit

TRANSPOTATION

PRECAUTION

- Only trained, qualified workers should operate forklift truck, crane or similar equipments and apply slings.
- The wires used to lift should be checked that they are strong enough for the weight of machine center and in good condition. The dimensions of steel ropes specified in manual.
- Be sure that the wires will not run into any delicate parts of machine center.
- Before hoisting machine, make sure all moving units are fixed securely as well as in place.
- Be careful and avoid the hoisting rope contacting with any piping unit, parts and electric cables.
- Check around the site of machine and make it clean, proper to be installed, that is, can keep machine away from jolt during move or transport machines.
- Always inspect slings, chains hoists and other lifting devices prior to us and never work on or stand under a component while it is hanging from an over-crane or other hoisting mechanism.
- The floor of machine located must be firm, in order to ensure vibration free and secure fastening. Should the floor not be firm, a concrete foundation is recommended.
- Keep the machine's center of gravity at the center of the forks.
- Be careful during remove the wooden cage or vacuum package and keep away from damage onto the machine inside or people around will get injured.
- Ensure that there is a little clearance between the back panel of machine and forklift truck or use protective pad.
- Be sure electric cables and wires will not be damaged during hoisting machine from the skid.
- Before hoisting the machine, make sure that each of the units is fixed securely.
- Be careful during remove the machine to proper site and install it.
- Keep clean around the machine and floor.
- Be sure electrical cables and wire will not be damaged during installing machine.
- After installation and clean, connect the wire to the power source and ensure the requirement of power capacity is proper.
- Before using, remove the anti-rusty oil by rags with paraffin or fuel oil. Toluene compounds must not be use.

Note: Refer to the drawing following end of book.

Environmental requirement

Requirement point

- Where the machine center avoid exposing to the direct sunlight and/or near to a heat source, etc.. Ambient temperature during operation is 0 to 40℃ (32 to 104℉).
- Avoid a location where the humidity is considerable fluctuating and/or it is highly humid. Normally 75％ and below in relative humidity.
- Avoid using the machine center under such environment as to be especially dusty or to have a vaporous, organic and corrosive gas highly concentrated.
- Flat and smooth ground without dust or other particles. The required bearing pressure of the floor is at least 5000 kg/㎡.
- Where there is no vibration source around the factory.
- The machine must be protected from electrical noise sources, such as electric welders and an electric discharge machines.
- Always ground machine independently, the ground resistance is 100 ohms or less and the length of ground cable is as short as possible.
- The sound pressure level at the operator's position is under 80dbs. (According to JIS B6004, 1980; Method of sound measurement for machine tools) It is the policy of the company to remedy the machine if the sound level is over 80 DB while running test.
- Foundation should be constructed of either reinforced or non-reinforced concrete with thickness and consistency compatible to industry for machine weight.
- The 24V DC voltage must be generated as a functional extra low voltage with safe electrical isolation and be grounded by the user.

Power supply

It is recommended that the electrical equipment of a machine only have one power supply connection. When other voltages are required the machine, then these should be supplied by equipment which is part of the machine such as transformer, motor generator and so on.

The current standard voltage values

Republic Of China

- AC-220V±10% (single phase/60Hz).

Europe multitude

- AC-380V ±10% (3 phases/50Hz)
- AC-220V ±10% (single phase)

In States

- AC-230V ±10% (3 phases/60Hz).

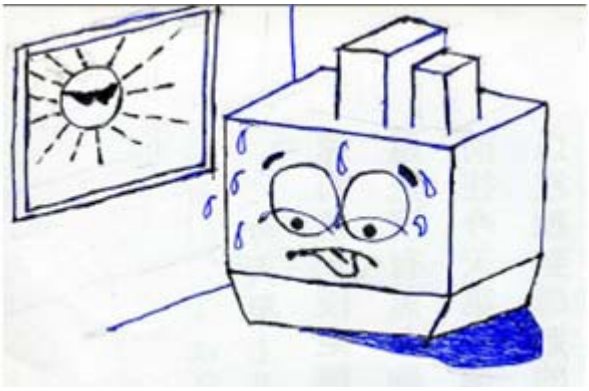
Ground connection

- Don't Cascade parallel connected with other machine in grounding.

- Parallel connection in grounding is OK.
- Voltage need correct by name plate on side of machine.
- Size of electrical wire § 14 mm^2 diameter(ground wire).
- Ground resistance below 100Ω.

Condition of storage

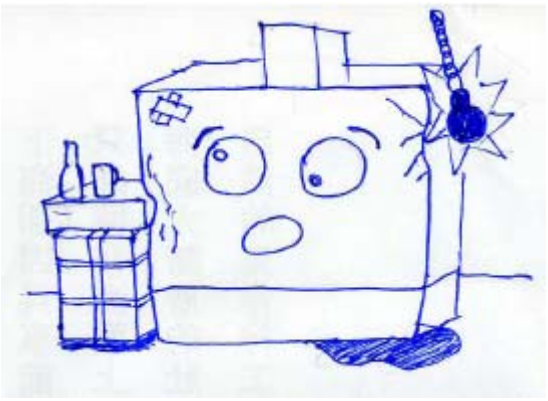
The machine and the NC must not be subject to direct sunlight.



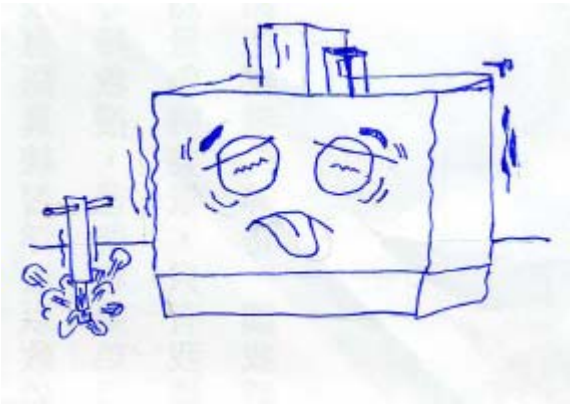
Maintenance space must be secured.

The door must be able to open without iterance.

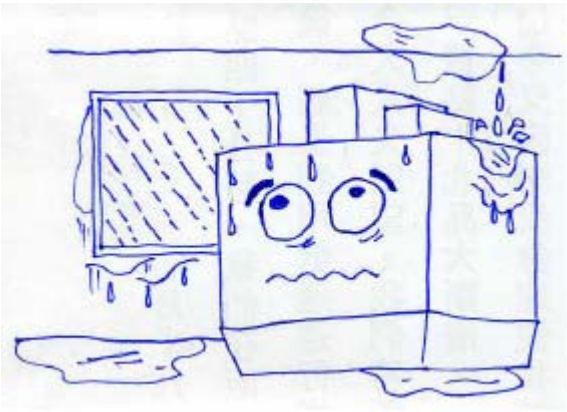
The chip conveyor, chip bucket and coolant tank must be able to pull out from the machine without interference.



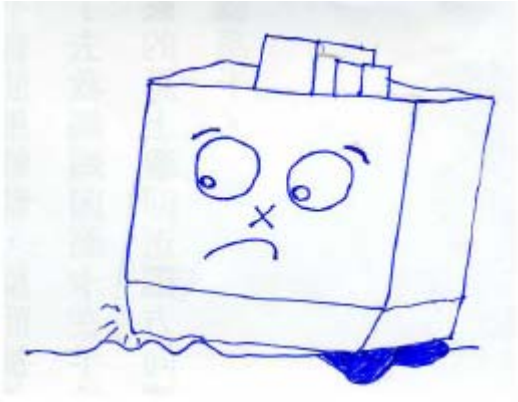
The ground must be capable of absorbing the vibration of other machines, such as presses. If vibration is felt where the machine is installed, measure is magnitude with a micrometer.



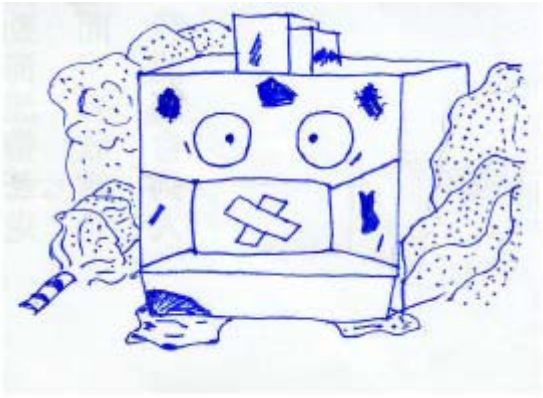
The ambient humidity must be less than 75% and free of condensation. Because many electronic parts are use in the machine and the NC, excessive humidity must be avoided.



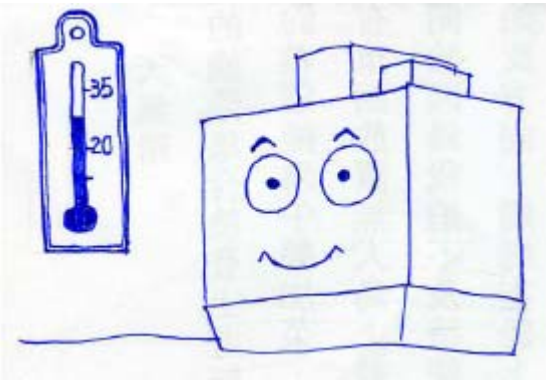
The surface where the machine installed must be smooth and flat.



The machine must not be subject to chips scattered from other machine or airborne dust.



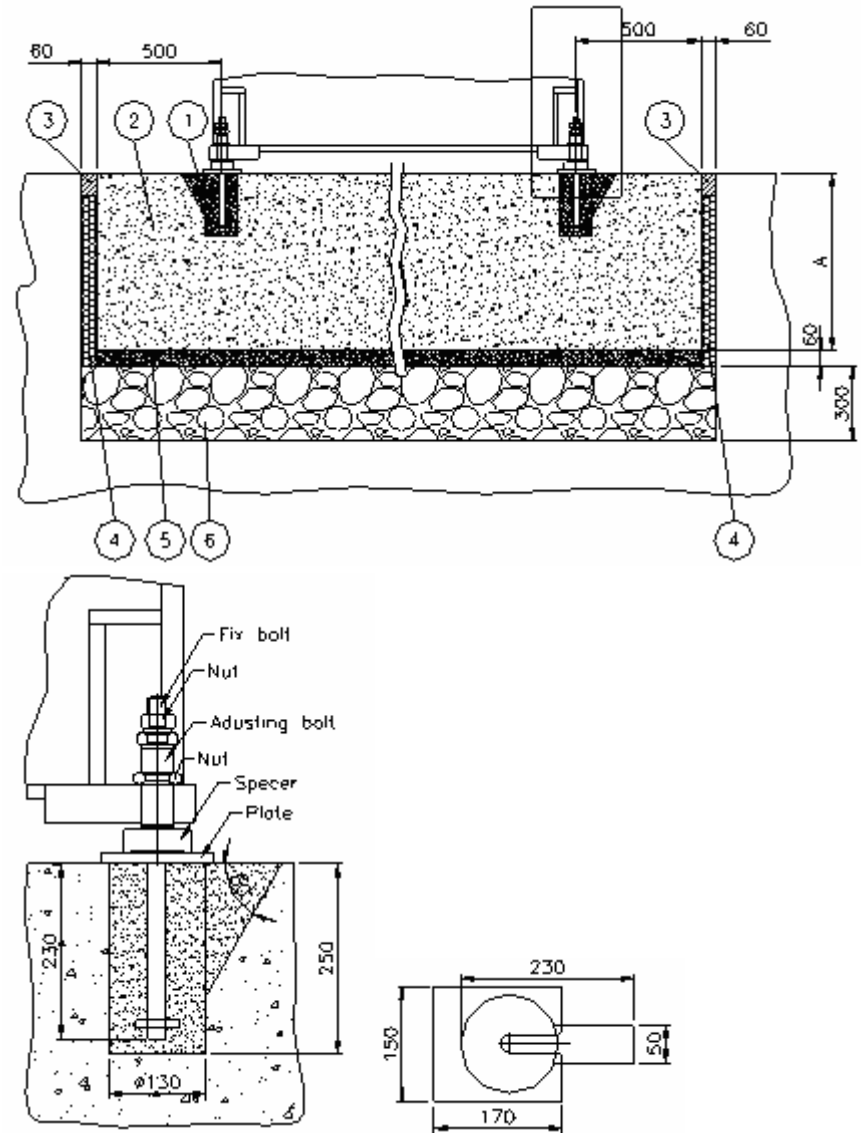
The ambient temperature must be between 0 and 30˚C



Setting the ground

Ground required

If you want to promote the effective product the best way is set out the ground. The flat and smoothly floor could be good for settling down the machines. Refer to the following drawing for the ground arrangement



A=350(V450/V650/V33i/V42i)
A=500(V1100/MV1100/MV1300)
A=700(LX1610/LX2210/MV1750)
A=1000(LX-B all mode)

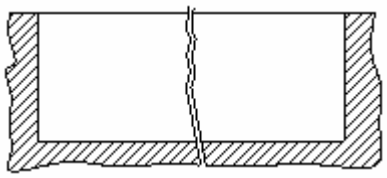
[1] Concrete 5000pci
[2] Concrete 3000pci
[3] Anti-oil/heat bronze
[4] Anti-vibration polylone
[5] Anti-vibration sand
[6] Round-shapes stone Dia. 150~300 mm

⚠ CAUTION

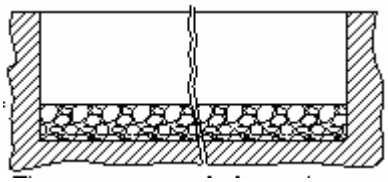
The floor plate must be completed in compliance with the latest valid guidelines and the generally adopted technical regulations. If applicable, contact a renown engineer specialized in stoical calculation, observe the maximum floor pressure of the local conditions.

Setting step

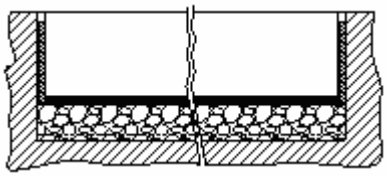
According to foundation drawing set the foundation area.



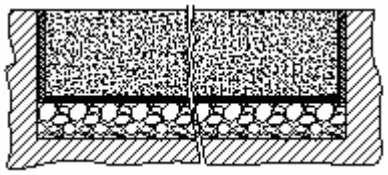
First, put stones on the bottom.
(Stone dia.150~300 mm)



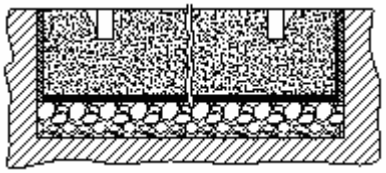
Fill up the sand and poly-foam plate on the other side.



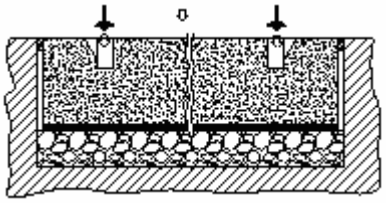
Put the oil-proof and anti-head stripe on the side, then fill up the cement (3000 pci), harden time about 7~10 days



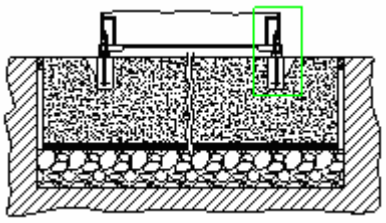
Dig out the hole of anchor bolts.



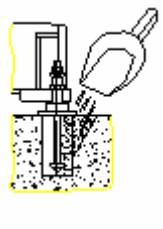
Hoist machine higher and install the anchor bolts.



Put whole machine into the position.



Fill up with 5000 pci cement harden time 2~4 days



The following drawing showing on the end of book.

Before power on

- Only the trained, qualified or authorized personnel can remove and settle machine, accessories and so on.
- After transporting machine to the adequate site of factory, remove vacuum package or accessories skid from shipping pallet.
- Remove the shackles, sling and eyebolts. Fixed brackets between table-saddle and saddle-base and hoisting devices from machine.
- All the bare parts of the machine, which have been coated with a rust inhibitor for transportation must be carefully cleaned by rags with paraffin or fuel oil and wrung out. Note: Toluene compounds must not be used.
- Takes away the brackets fixed onto the operation cabinet.

⚠ CAUTION

Unless power on, do not move away the fixed bracket under head stock which is the last one to remove.

- Place the cover of the right side base and tighten the screws on it.
- Set down the accessories such as coolant tank with chip collection trough, fixed pump on the plate of coolant tank.
- Set the transformer and chip conveyor to proper places then plug the socket onto the bottom of power cabinet.
- Make sure the main power supplier switch is turned off before the power cable connected to the power source.
- Connect the fasteners or joints of cables, wire and pipe wherever they will be.
- Connect the main cable of machine with the terminal in power source box of factory.
- Check if the power capacity or voltage is fitted on the machine requirement.
- Check if the phrases of motors and pump are correct by phrase-meter.
- After everything being settled down, power on and turn on the main power switches of machine, which is on operation cabinet and power cabinet. Then check there is any abnormal signal or alarm appeared on the CRT or operation panel.
- By using MPG, let the spindle headstock upward a little and take away the supporting block under it.

Note:

If there is no display on the screen of operation panel after power on, please refer to the parameter tables of electric manual to input data and restart again.

Leveling adjust

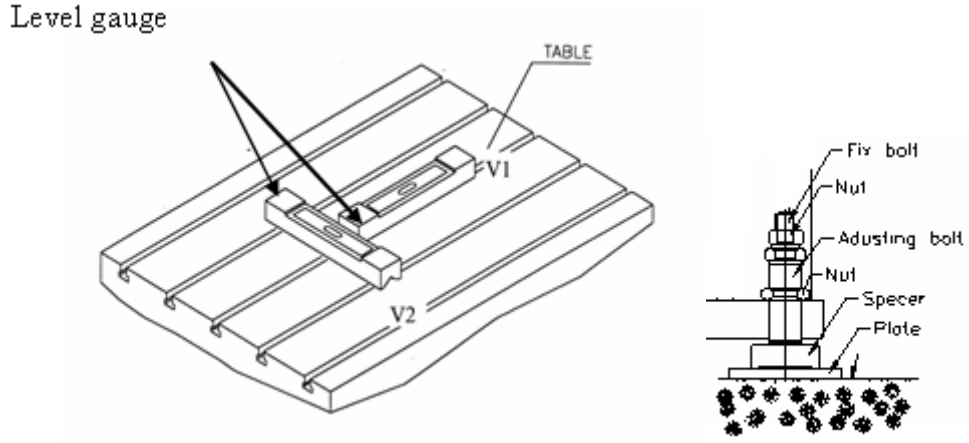
Leveling required

Using leveling gage to check the level of machine. The gage reading must be with 0.01mm/M. The leveling situation is very important to the accuracy of this machine. We must do the following steps.

Adjust procedure

To complete this procedure follow the next procedure:

- After the processes of installation, the machine level may undergo minor changes with the elapse of time. Make it a point to check the level periodically.
- Move the table and saddle to the center position of machine by programming or manual operating.
- Place the levels on the table to adjust or modify the foundation bolts and nuts by the bubbles of level gauges, which are located on the center of levels, that is, machine reach the static level.
- At first, adjust the front and rear of foundation bolts, then middle ones.
- Tighten the bolts and nuts orderly.
- After static level, move the table along Y-axis direction with three points during the moving of full travel. The bubbles of level should be indicated the movement within one grid of levels and modify bolts and nuts.
- Tighten the foundation nuts after leveling along the Y-axis direction.
- Follow the same steps as step 6 and 7 but along X-axis direction to measure the dynamic level of X axis and the movement must be in half grid of levels' bubbles.

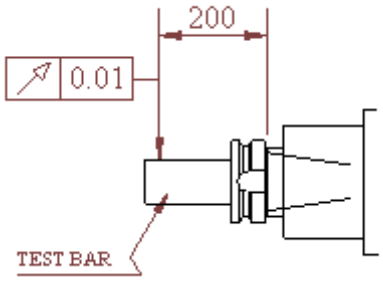


Tools system

ISO 40/50

Vibration required

- The tool must have a concentric running. Vibrations caused by radial tool deviation may lead to a tool breakage and put the operating staff into danger!
- Before the tool insertion, the wing surfaces must be cleaned from soiling.
- Even the slightest foreign matters which may have fallen between the wing surface cause radial deviation!
- Check radial deviation at tool holding cone with test bar (see figure)

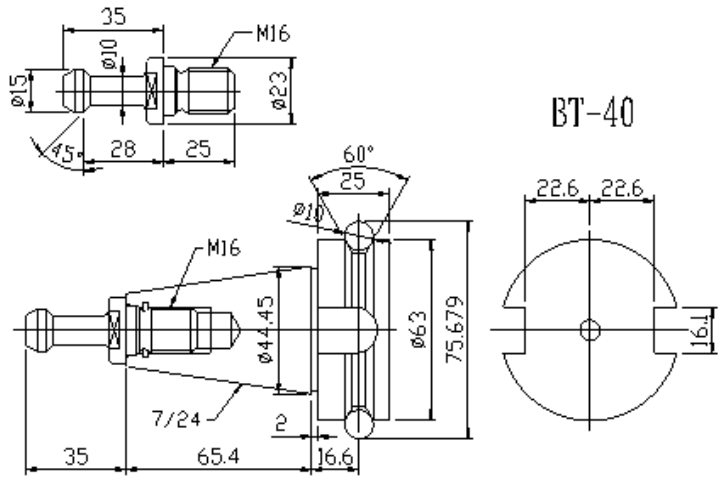


⚠ CAUTION

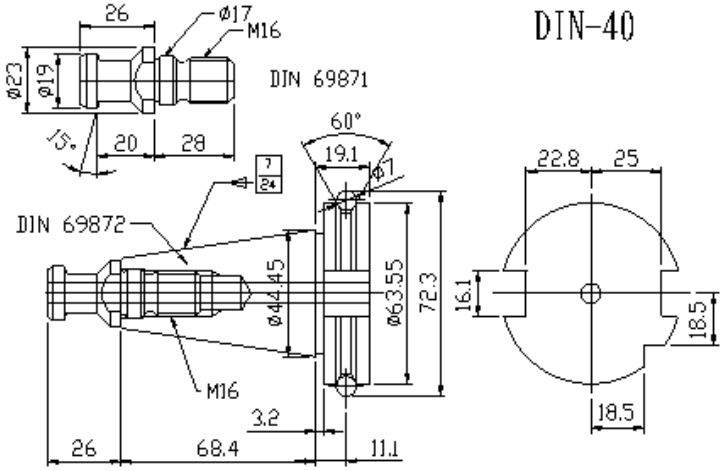
The tool in use must be permitted for the according rotation speed by the tool producer.

Tools specification
ISO 40 serious

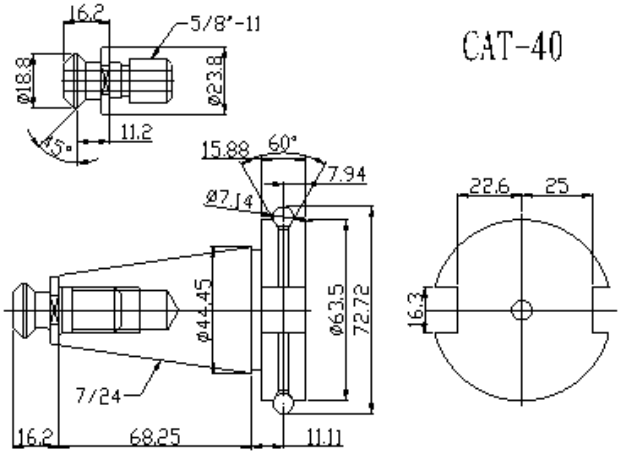
BT-40



DIN 40

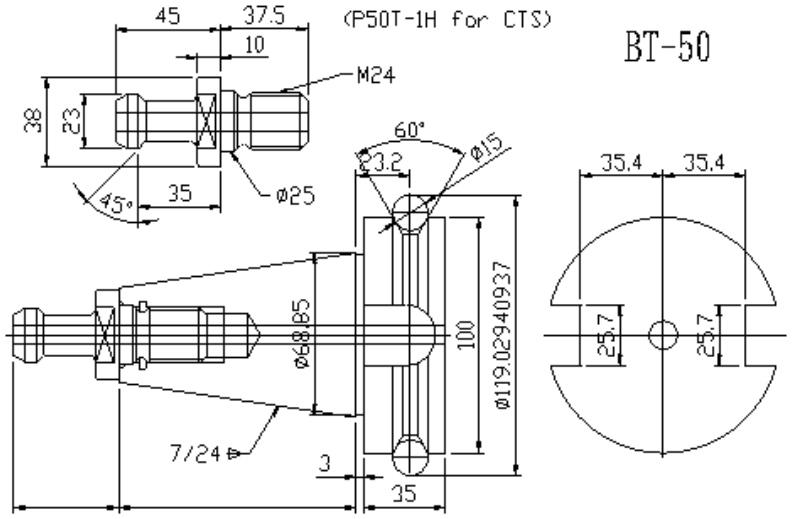


CAT 40



ISO 50 serious

BT 50



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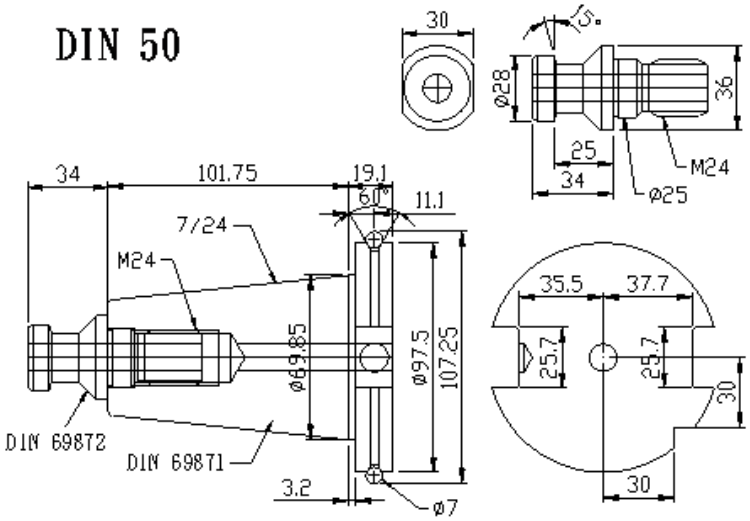
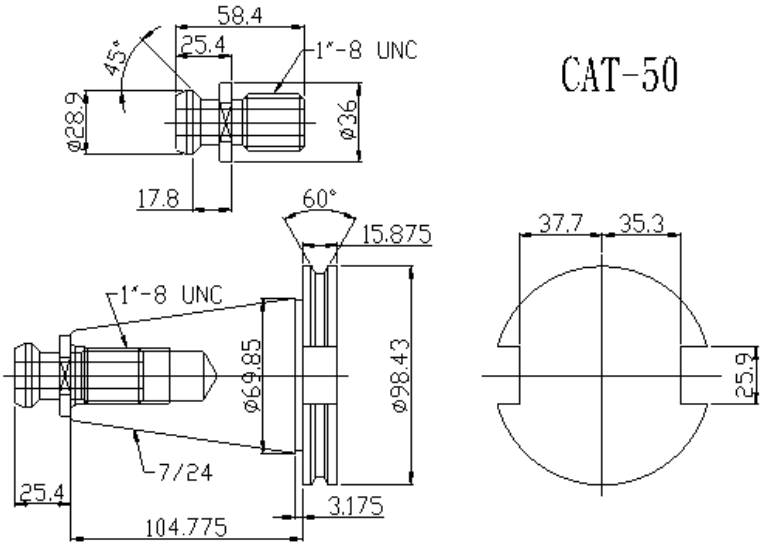


CAT 50



Oil usage

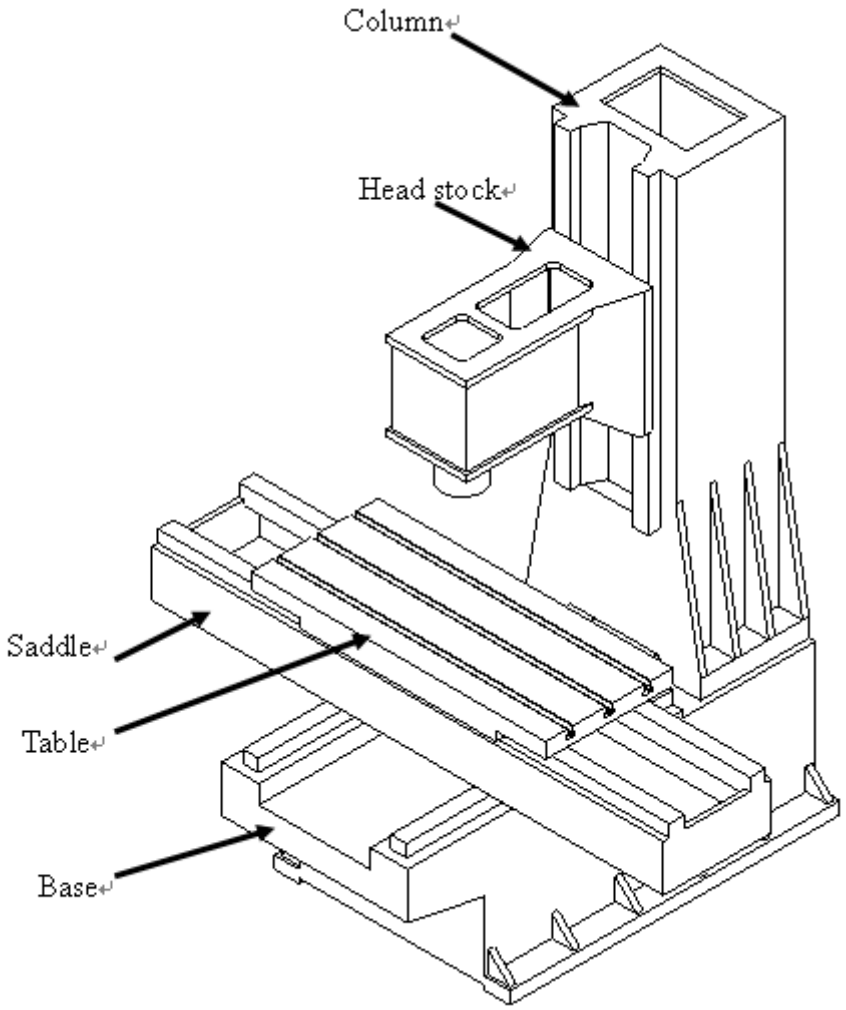
Recommendation label

OIL USAGE RECOMMENDATION

ITEM \ BRAND	ISO	MOBIL	MOBIL Synthetic oil	SHELL	BP	CPC	CALUBE
Cutting fluids (water soluble)		CUT 232					WCR-F200
Lubricator of pneumatic	VG22	Velocite 10		Tellus 22	Energol CS 22	Spindle oil R22	
Lubricator system (ball screw, slide way)	VG68	Vactra NO.2		Tonna T68 Tonna S68	Maccurat D 68	Way Lubricant 68	
Oil cooler of spindle	VG22	Velocite 10		Tellus 22	Energol CS 22	Spindle oil R22	
Hydraulic system	VG32	DTE Light	SHC 624	Tellus 32	Energol HP 32	Circulation Oil R32	
Tool release cylinder	VG32	DTE Light	SHC 624	Tellus 32	Energol HP 32	Circulation Oil R32	
Gear box of spindle	VG32	DTE Light	SHC 624	Tellus 32	Energol THP 32	Circulation Oil R32	
Gear of rotary table (Angle head)	VG150	Mobilgear 600xp 150	SHC 629	Omala 150	Energol GR-XP 150	E.P Lubricant HD 150	

399005B0

Moving direction



Axis	Travel	Direction of travel		Origin
X	Table Left/right	Advance to left	(+) direction	(+) End
		Advance to right	(-) direction	
Y	Saddle/table Forward/backward	Retraction	(+) direction	(+) End
		Advance	(-) direction	
Z	Head stock Up/down	Up	+) direction	(+) End
		down	(-) direction	

Coordinate system

The coordinate axes for NC machines are specified in standard specification DIN 66 217. As a generalization, the following applies to linear axes X, Y and Z, and the correlating rotary axes:

X Axis

The X axis is the principal axis in the positioning plane. It is usually located parallel to the work piece clamping area and runs horizontally in most cases.

Y Axis

The position and direction of the Y axis results from the specifications for the X axis and Y axis. A right-angled Cartesian coordinate system is used.

Z Axis

The Z axis is parallel to the axis of the work spindle or coincides with it. For drilling and milling machines, the work spindle carries the tool. The work spindle carries the work piece for lathes. The positive direction of the Z axis runs from the work piece to the tool, or, in the case of lathes, from the work spindle to the work piece.

Rotation Coordinates

The rotation axes A, B and C are assigned to the X, Y and Z coordinate axes (see next page).

Based on the positive direction of the coordinate axes X, Y, Z, the positive direction for the corresponding rotary axes A, B, C is given by clockwise rotation.

Direction of Movement

If the tool support is moved, the direction of movement and axis direction are rectified. The positive directions of movement are designated with +X, +Y, +Z, etc.

If the work piece fixture is moved, the direction of movement and axis direction are acting in opposite direction to each other. The positive directions of movement are designated with +X', +Y', +Z', etc.

Right-Hand Rule:

If you place your thumb in the direction of the positive X axis and your middle finger in the direction of the positive Z axis, the position and direction of the Y axis is determined by your pointer finger

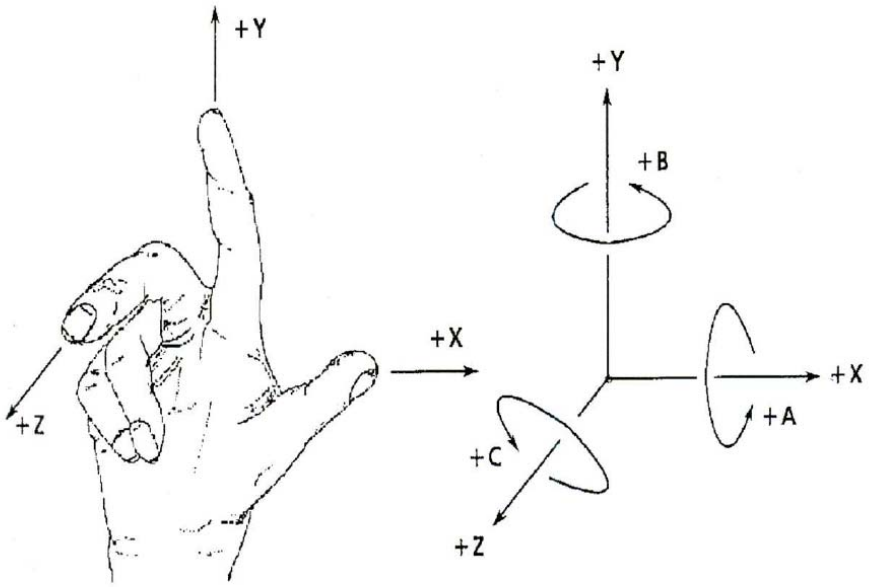


Figure according to DIN 66 217

Maintenance point table

POINT / TIME	D	W	M	6 M	Y
Machine body					
Clean the chips on the table	☐	☐	☐	☐	☐
Clean and lubricate the table	—	☐	☐	☐	☐
Clean the chips on the chip plate	☐	☐	☐	☐	☐
Clean and lubricate telescopic covers	—	☐	☐	☐	☐
Clean guard and window	☐	☐	☐	☐	☐
Clean the chips between slide ways	—	—	☐	☐	☐
Clean and lubricate slide way	—	—	☐	☐	☐
Adjust wedge(box way type)	—	—	—	☐	☐
Check the slide way if it normal	—	—	—	☐	☐
Clean and lubricate ball screw	—	—	—	☐	☐
Check the ball screw if it normal	—	—	—	☐	☐
Check the level and adjust	—	—	☐	☐	☐
Antirust foundation bolt	—	—	☐	☐	☐
Clean the chip in wire conduit	—	—	☐	☐	☐
Check the wire conduit if it normal	—	—	☐	☐	☐
Drain out the recycle oil tank	—	☐	☐	☐	☐
Spindle					
Clean and lubricate tool hold	☐	☐	☐	☐	☐
Check clamping force	—	—	☐	☐	☐
Check the tool release gap	—	—	☐	☐	☐
Change the motor belt	—	—	—	—	☐
Clean and lubricate tools	☐	☐	☐	☐	☐
Check and retighten pull stud	☐	☐	☐	☐	☐
Power cylinder					
Check and refill oil tank	☐	☐	☐	☐	☐
Check the solenoid if it normal	—	☐	☐	☐	☐
Change oil	—	—	—	—	☐
Automatic tool changer unit					
Remove the chip on disk	—	☐	☐	☐	☐
Clean and antirust guide chain	—	—	☐	☐	☐
Clean and antirust tool holder	—	—	☐	☐	☐
Check tool holder if it normal	—	—	☐	☐	☐
Clean and put antirust to the changer arm	—	—	☐	☐	☐
Add grease on the motion parts	—	—	☐	☐	☐

POINT \ TIME	D	W	M	6 M	Y
Operation box					
Check the bottom light if it is normal	☐	☐	☐	☐	☐
Check the switch if it is normal	☐	☐	☐	☐	☐
Electric cabinet					
Clean heat exchange fan net	—	☐	☐	☐	☐
Clean and retighten electric parts	—	—	☐	☐	☐
Check the heat changer if it normal	—	—	☐	☐	☐
Check and retighten the locking bolts	—	—	☐	☐	☐
Oil cooler unit					
Check and refill oil to the level	☐	☐	☐	☐	☐
Check the temp. setting	☐	☐	☐	☐	☐
Check the function key if it is normal	☐	☐	☐	☐	☐
Check the temp. sensor if it is normal	☐	☐	☐	☐	☐
Clean the fan net	—	☐	☐	☐	☐
Change the oil level	—	—	—	—	☐
Pneumatic unit					
Check and adjust pressure	—	☐	☐	☐	☐
Check and refill oil into lubricate tank	☐	☐	☐	☐	☐
Check and adjust lubricate cycle	—	☐	☐	☐	☐
Check the pressure switch setting	—	☐	☐	☐	☐
Check the drain vale if it is normal	—	☐	☐	☐	☐
Change the air filter	—	—	☐	☐	☐
Check the solenoid if it is normal	—	—	☐	☐	☐
Lubricator system					
Check and refill oil to the level	☐	☐	☐	☐	☐
Check and adjust pressure	—	☐	☐	☐	☐
Check if there is any leakage	☐	☐	☐	☐	☐
Check the pressure switch setting	—	☐	☐	☐	☐
Clean the enter filter	—	—	☐	☐	☐
Coolant system					
Check and refill coolant liquid	☐	☐	☐	☐	☐
Remove chips and clean filter	—	☐	☐	☐	☐
Remove the chips from the chip bucket	☐	☐	☐	☐	☐
Check the chip conveyor if it is normal	—	—	☐	☐	☐
Check the pump if it is normal	☐	☐	☐	☐	☐
Check and add grease driven chain	—	—	☐	☐	☐
Change liquid and clean tank	—	—	☐	☐	☐

POINT \ TIME	D	W	M	6 M	Y
Hydraulic system					
Check and refill oil to the level	□	□	□	□	□
Check and adjust pressure	—	□	□	□	□
Check if there is any leakage	—	□	□	□	□
Check the pressure switch setting	—	□	□	□	□
Check the solenoid if it is normal	—	—	□	□	□
Change the clean filter net	—	—	—	□	□
Change oil and clean oil tank	—	—	—	—	□

2-Machine

TABLE OF CONTENT

V -1100/V-1360 specification

Table(V-1100)

Table size	mm(in)	1350x600 (53x23.6)
T slot		5-18Tx125
Max. load	kg(lb)	800(1760)
High	mm(in)	1010(39.7)

Table(V-1360)

Table size	mm(in)	1500x600 (59x23.6)
T slot		5-18Tx125
Max. load	kg(lb)	1200(2640)
High	mm(in)	1010(39.7)

Travel(V-1100)

X axis	mm(in)	1100(43)
Y axis	mm(in)	610(24)
Z axis(St)	mm(in)	600 (23.6)
Spindle nose to table	mm(in)	115-715 (4.5-28.1)
Spindle center to column	mm(in)	638(25.1)

Travel(V-1360)

X axis	mm(in)	1360(53.5)
Y axis	mm(in)	610(24)
Z axis(St)	mm(in)	600 (23.6)
Spindle nose to table	mm(in)	115-715 (4.5-28.1)
Spindle center to column	mm(in)	638(25.1)

Spindle

Spindle taper		#40
Max. speed	rpm	10,000
Housing diameter	mm(in)	150
Clamping force	kg	1,000
Transmission		Belt
Gear ratio		1:1

Axes feed

X/Y/Z rapid	M/min	24/24/20
X/Y/Z cutting	M/min	1-10

Accuracy(VDI 3441)

Positioning(P)	um	0.015
Repeatability(Ps Max.)	um	0.01

Automatic tool change system

Tool change mode		Arm type
Tool hold type		#40
Number of tool		24
Magazine type		Drum type
Max. tool diameter	mm	80
Max. tool length	mm	300
Max. tool weight	kg	7
Tool change mode		Drum type
Tool hold type		#40
Number of tool		20
Magazine type		Drum type
Max. tool diameter	mm	100
Max. tool length	mm	300
Max. tool weight	kg	7

Pneumatic system

System pressure	kg/cm^2	6~7
Air consumption	l/min	400

Lubricate system

Pump power	kw	0.025
Output loading	bar	20
Flow rate(Max)	cc/min	200
Tank capacity	litter	3

Coolant system

Pump power	kw	0.960
Output loading	bar	1.3
Flow rate	L/min	50~70
Tank capacity	litter	400

Power capacity

Transformer power	KVA	25

Machine weight(V-1100)

weight	kg	7000

Machine weight(V-1360)

weight	kg	7500

Accessories

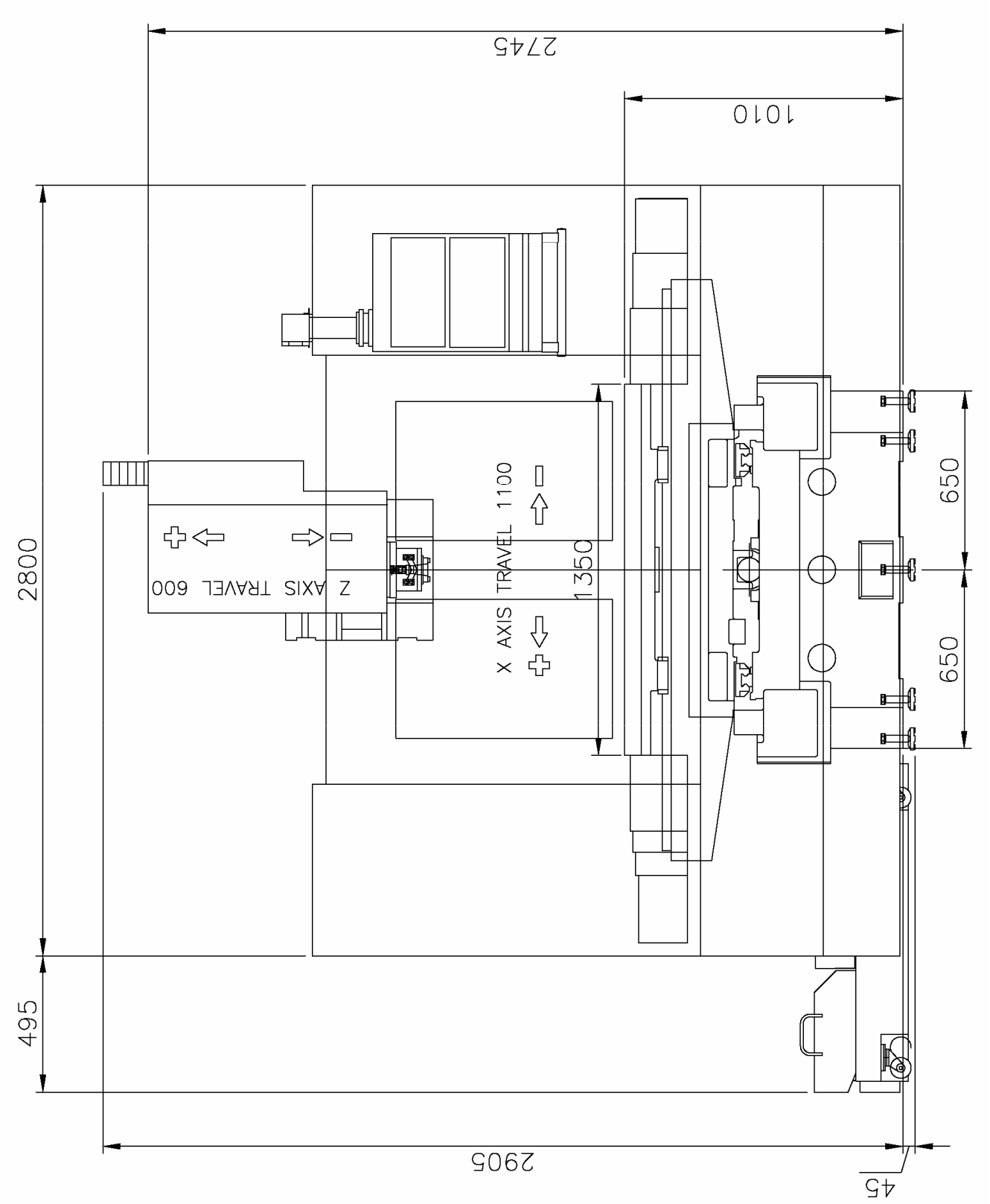
For V-serious machine

		St.	Op.
Automatic tool change unit	自動刀庫交換單元	O	
Air blow for tool changer	換刀吹氣	O	
Air blow for cutting	加工吹氣	O	
Air purge for spindle	主軸氣封防水	O	
Oil cooler system	主軸油冷裝置	O	
Coolant system for cutting	切削液循環系統	O	
Flush coolant for chip	底座沖屑裝置	O	
Screw conveyor	螺旋式排屑裝置	O	
Full guarding	外型保護罩	O	
Heat exchanger	熱交換器	O	
Leveling bolts and pads	地基調整螺絲及墊塊	O	
Tools in a tool box	工具箱(含工具)	O	
Water gun	水槍	O	
Air gun	氣槍		O
Work light	工作燈	O	
3 color alarm light	三色警示燈	O	
Pneumatic system	氣壓控制單元	O	
Auto lubricate system	中央集中潤滑系統	O	
Rotary table system	旋轉工作台系統		O
Separate MPG	分離式操作盒	O	
Oil/coolant separate system	油水分離機		O
Chain conveyor system	鏈排式排屑裝置		O
M30 power off	自動斷電(M30)	O	
A.T.L.M	刀長自動量測補正		O
Touch probe	工件自動量測裝置		O
Coolant through spindle	主軸中心出水裝置		O
Through hole drill hits	側進中出刀具中心出水		O
CTS(20bar/150L)	加裝加壓水箱(20bar/150L)		O
CTS(20bar/300L)	加裝加壓水箱(20bar/300L)		O
DNC link interface	DNC 連線界面	O	
Rigid tapping	鋼性攻牙	O	
Extension column	立柱加高		O
Oil mist collator	油霧切削裝置		O

Out line drawing

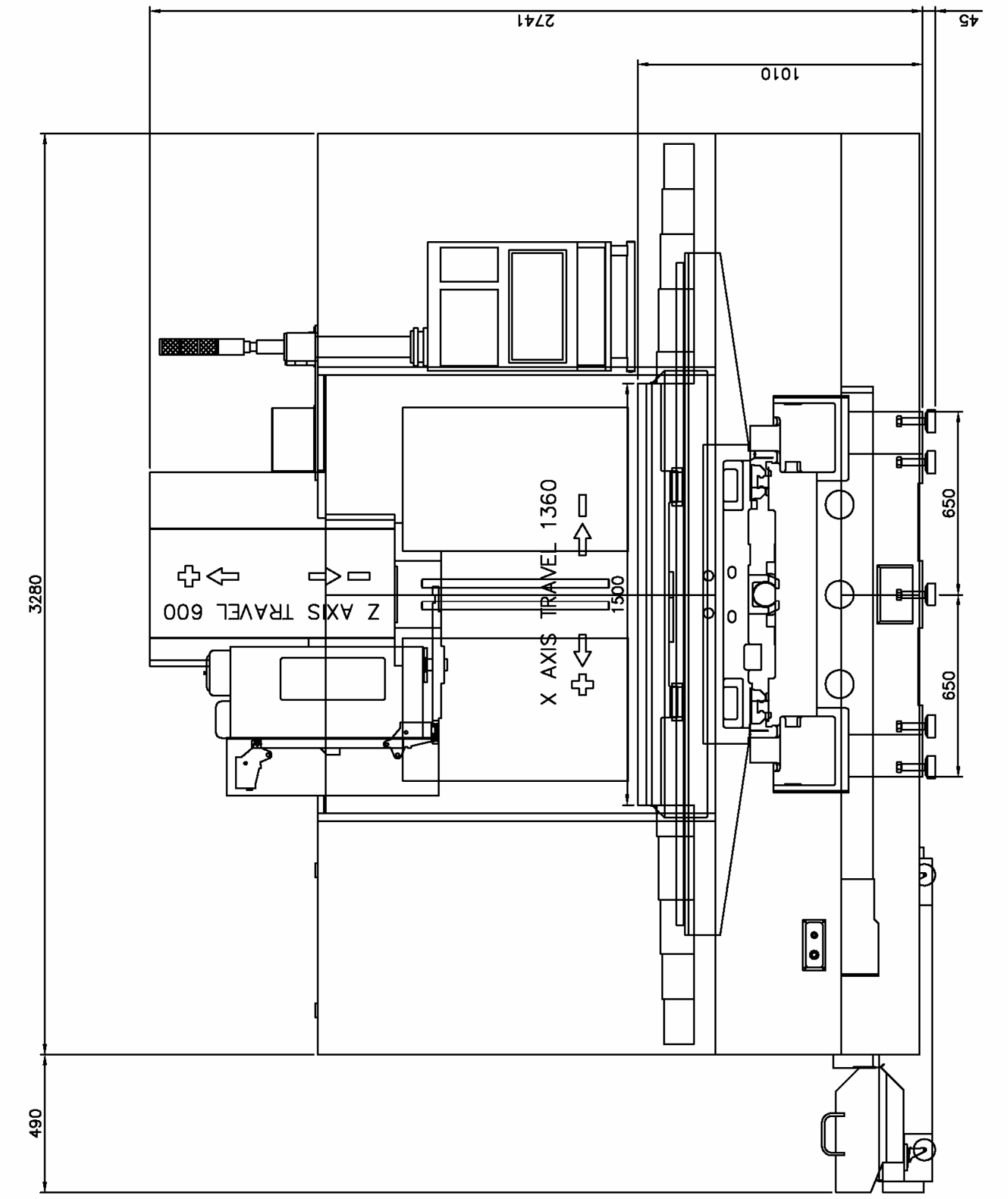
V- 1100

Front view



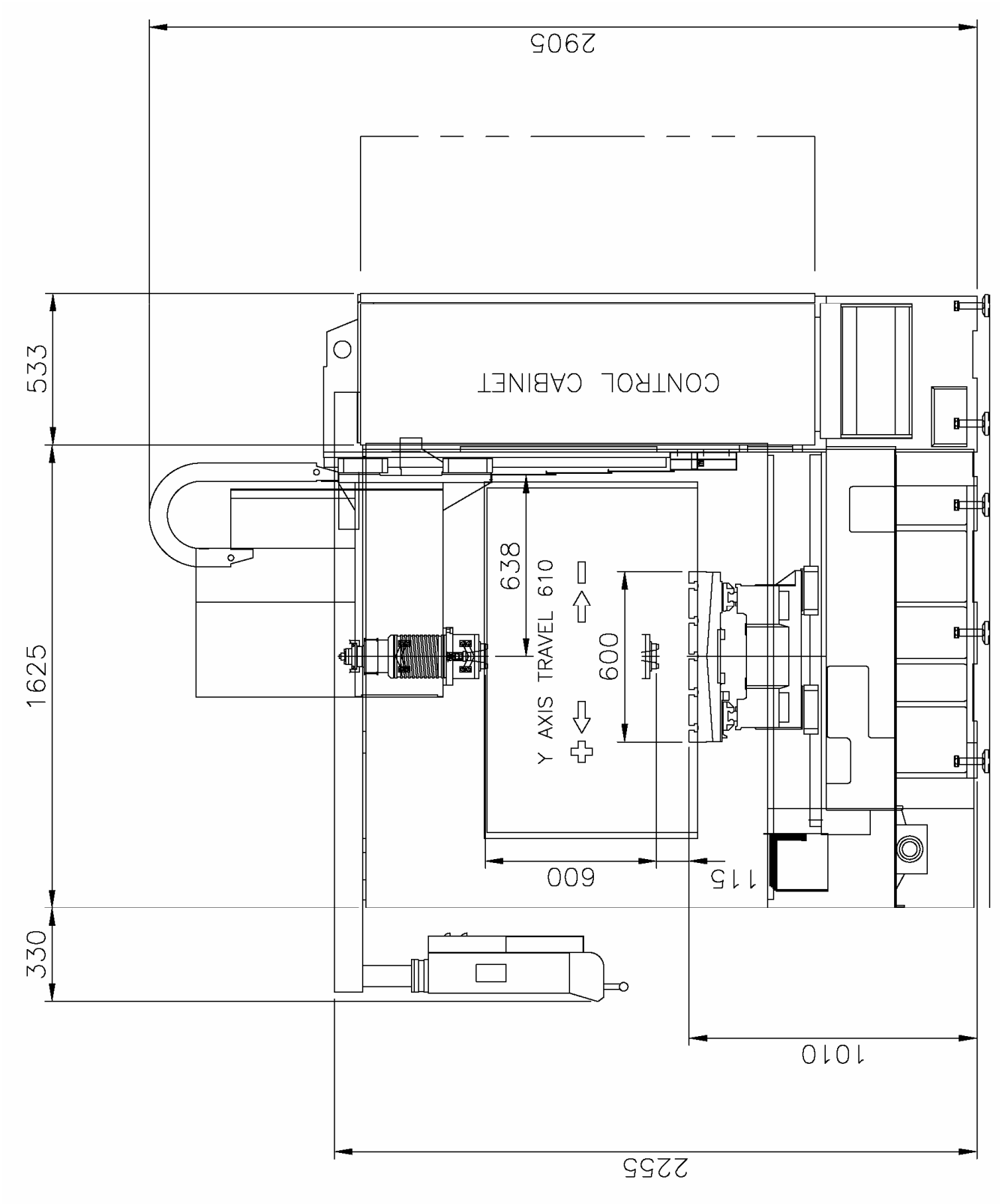
V -1360

Front view



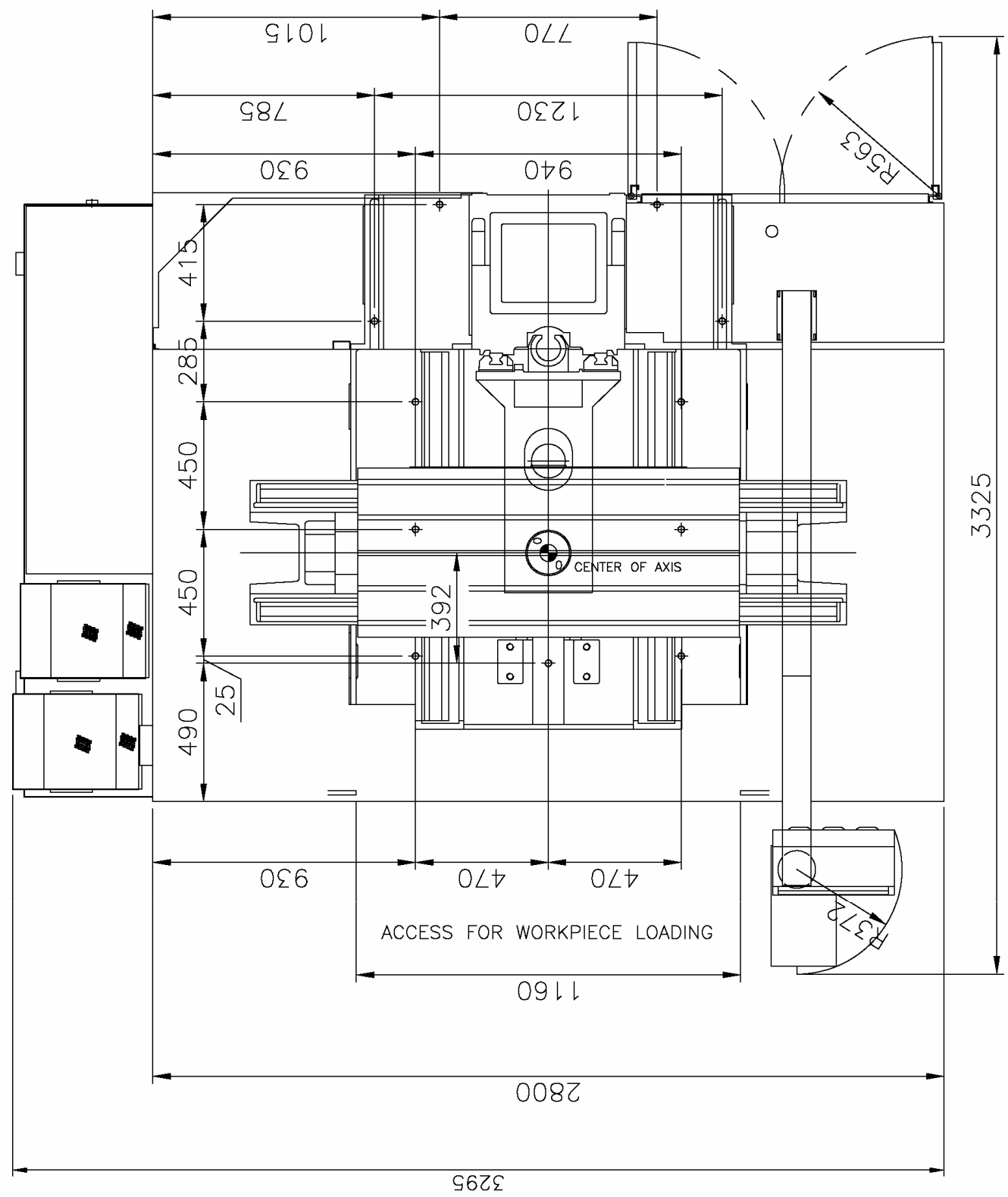
V 1100/V1360

Side view



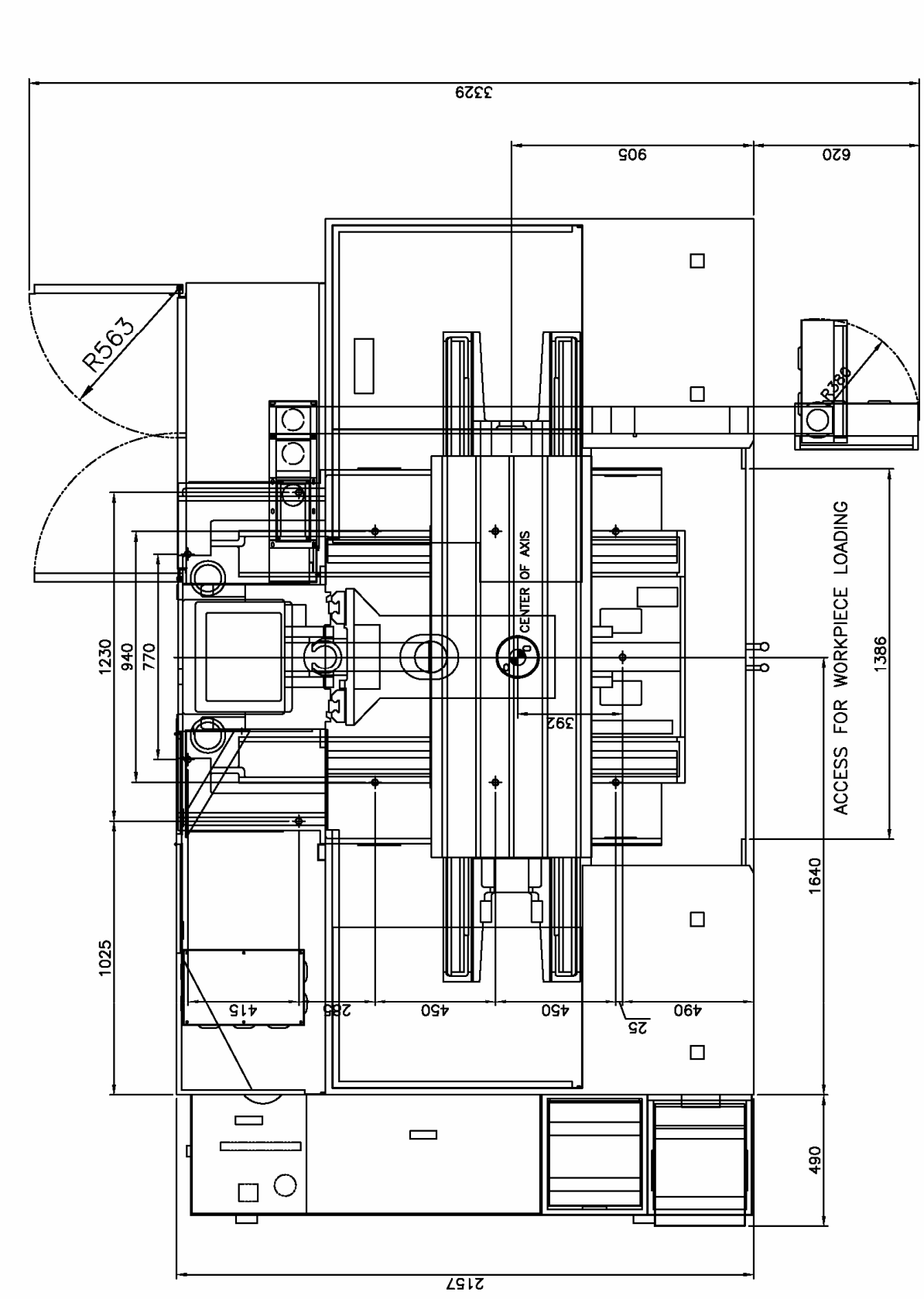
V-1100

Top view



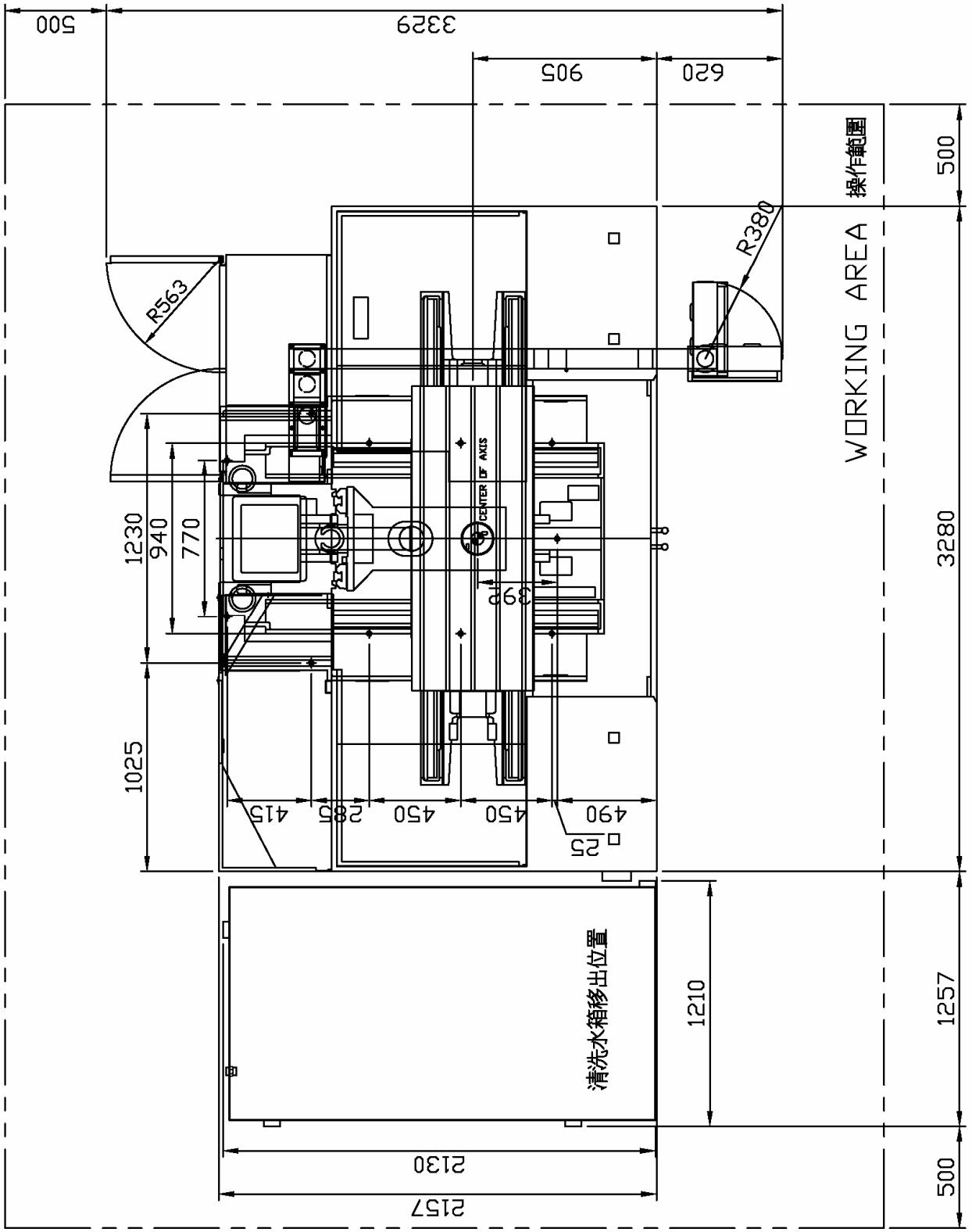
V-1360

Top view



Foundation anchor set up drawing
V-1100

Standard type



Foundation anchor set up drawing
V-1360

Standard type

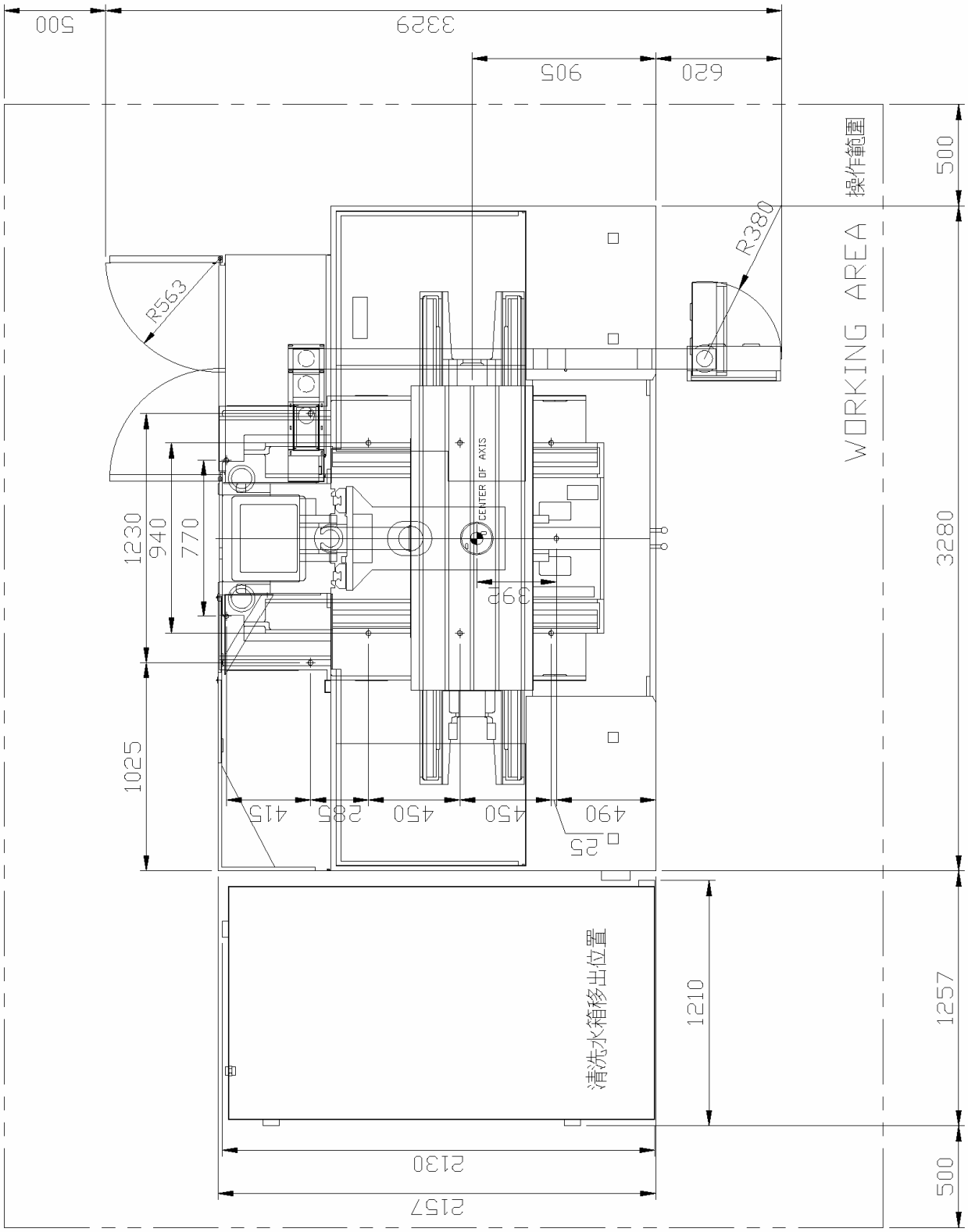


Table dimensions

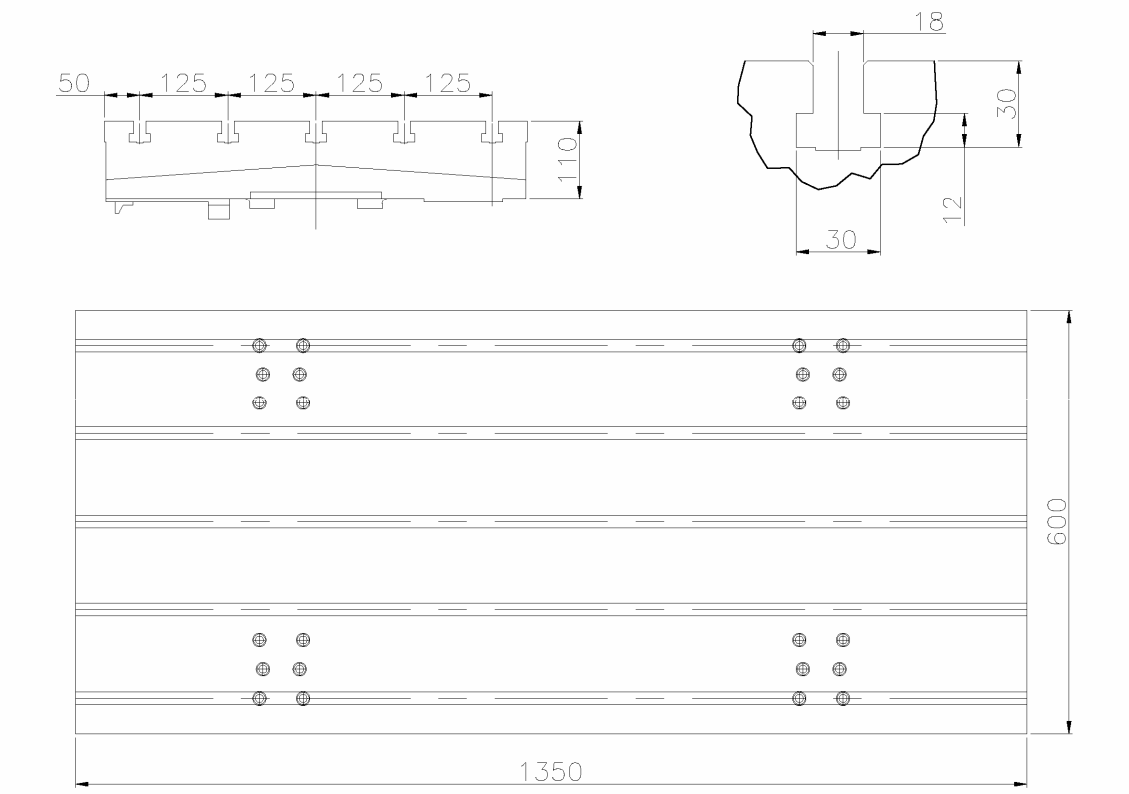
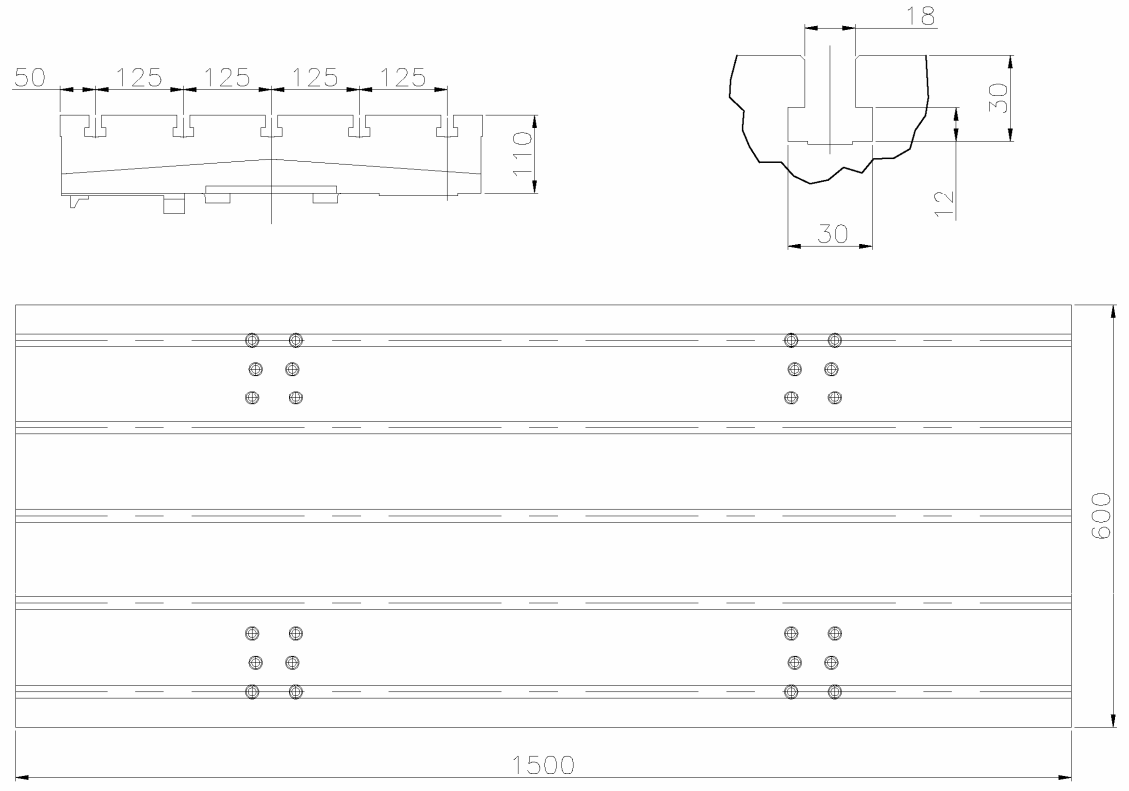


Table dimensions

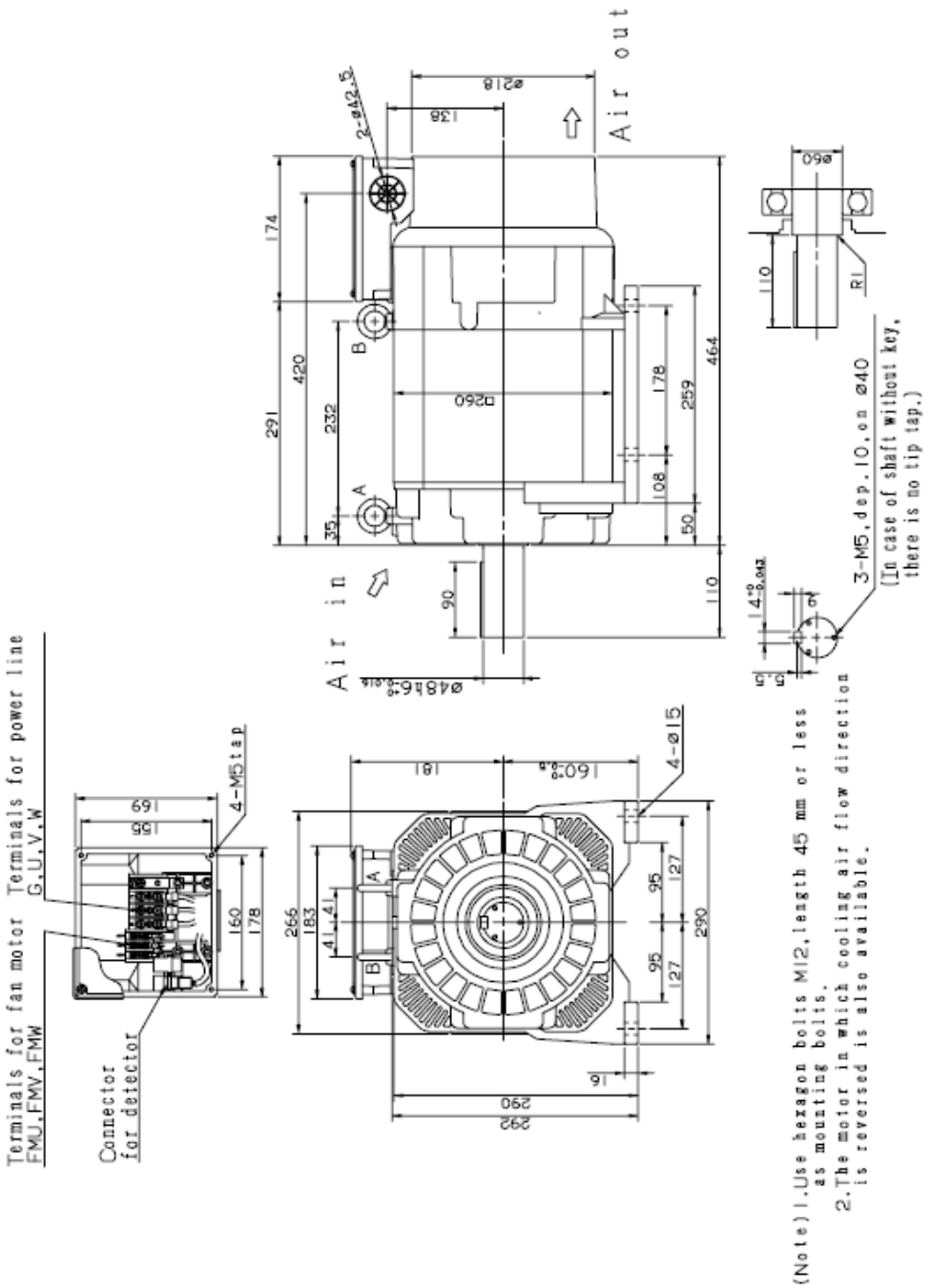


Main motor and axis motor (For V 1100/V 1360)

Main motor

α 15/10000i

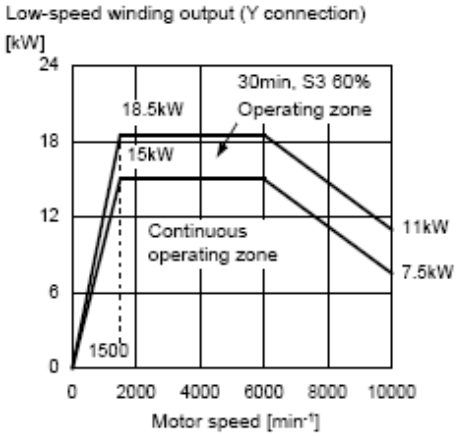
Outline

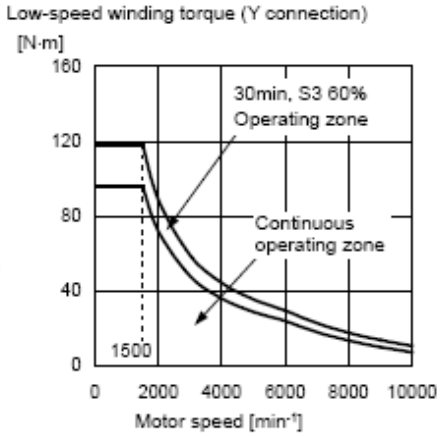


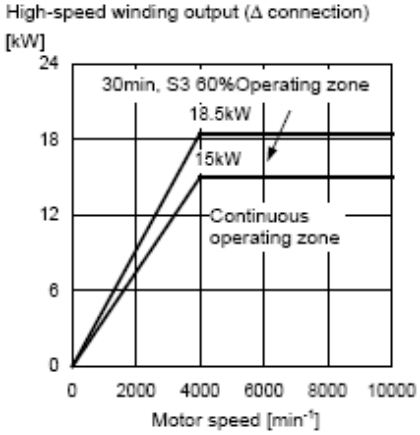
Specification

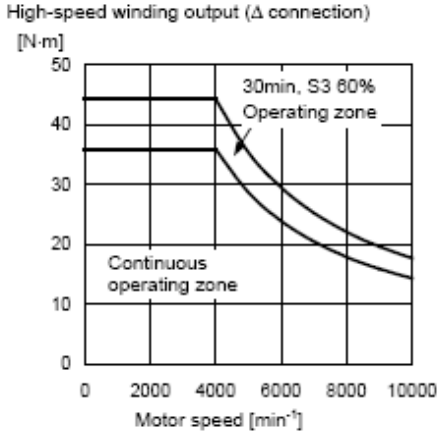
Series		αi series	
Item \ Model		α15/10000i(*1)	
		Low-speed winding	High-speed winding
Output (*2)	Cont. rated kW (HP)	15 (20.1)	15 (20.1)
	30 min rated kW [15 min, 10min] (*3) (HP)	18.5 (24.8)	18.5 (24.8)
	S3 60% kW [40%,25%] (*4)(*5) (HP)	18.5 (24.8)	18.5 (24.8)
Rated current A (*6)	Cont. rated	74	
	30 min rated (*3) S3 60% (*4)	85	
Speed min^{-1}	Base speed	1500	4000
	Max. speed	10000	10000
Output torque (Cont. rated torque at const. rated torque range) N·m (kgf·cm)		95.4 (974)	35.8 (365)
Rotor inertia	$kg·m^2$	0.09	
	$kgf·cm·s^2$	0.93	
Weight kgf		110	
Vibration		V5	
Noise		75dB(A) or less	

Output/Torque Characteristics







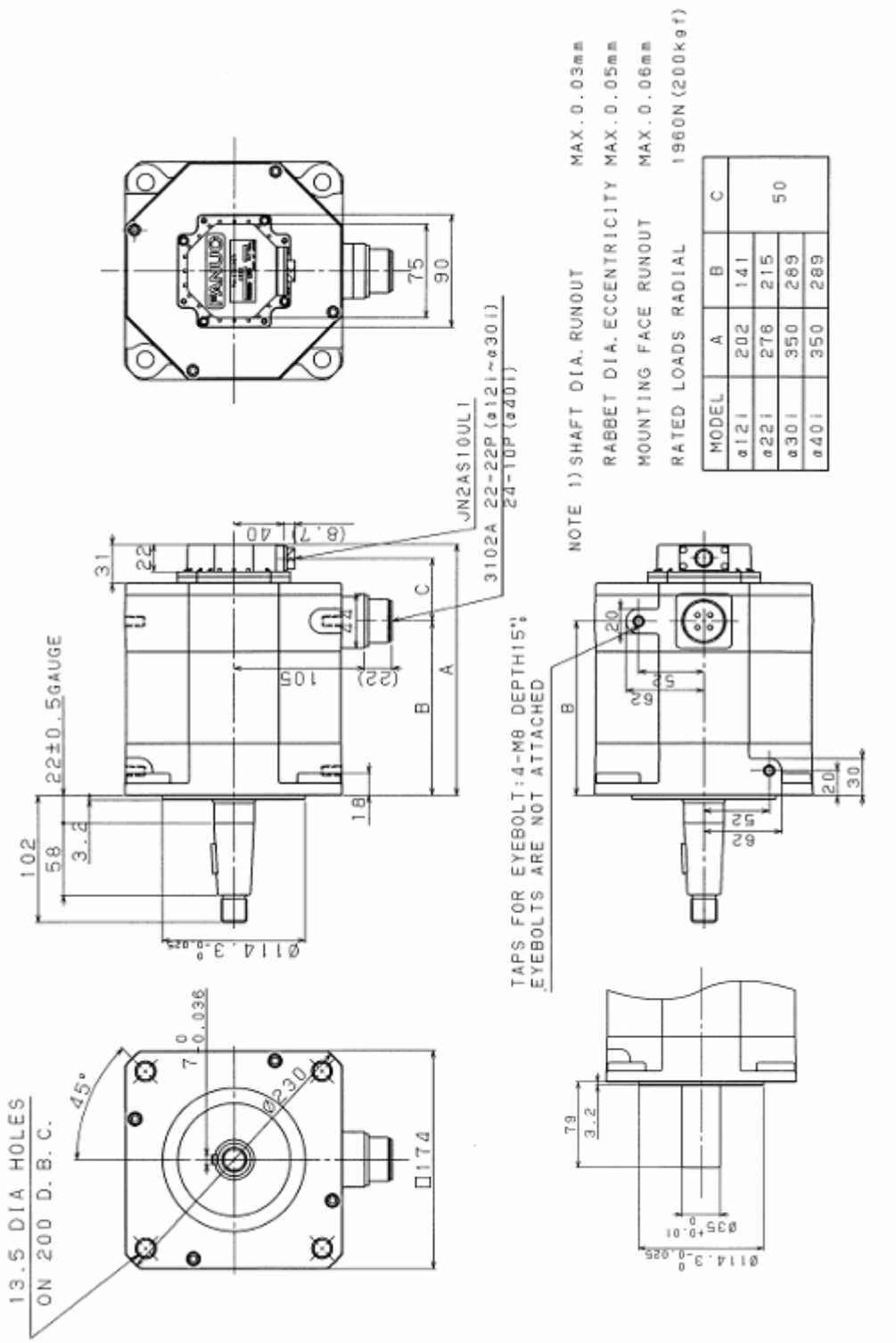


Axis motor

X and Y axis servo motor

α 22/3000i

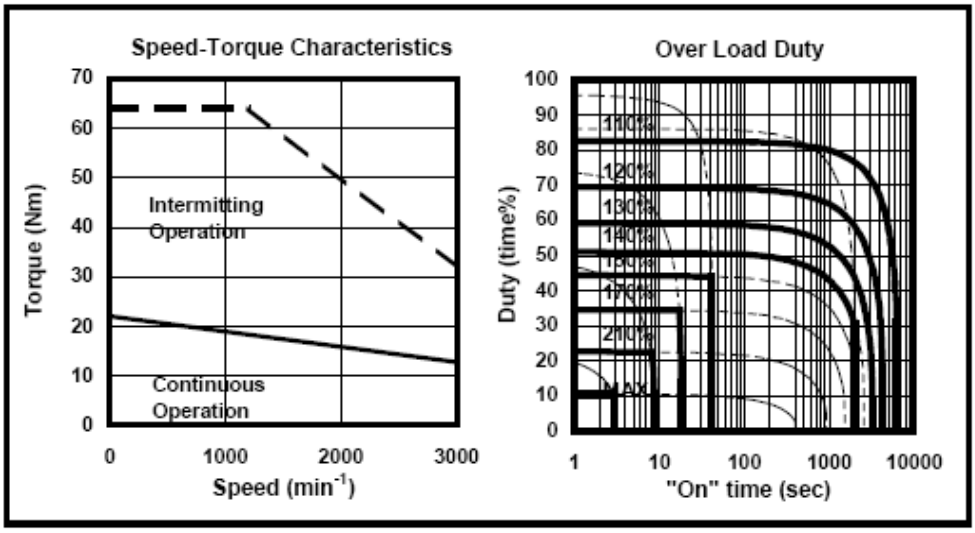
Out line



Specification

Item	Unit	α8/3000*i*	α12/3000*i*	α22/3000*i*
Output	kw	1.6	3.0	4.0
	HP	2.1	4.0	5.4
Rated torque at stall	Nm	8	12	22
	kgfcm	82	122	224
Rating rotation speed	min^{-1}	3000	3000	3000
Rotor inertia	kgm^2	0.0026	0.0062	0.012
	$kgmcms^2$	0.026	0.063	0.12
Mass	kg	12	18	29

The above values are under the condition at 20°C.



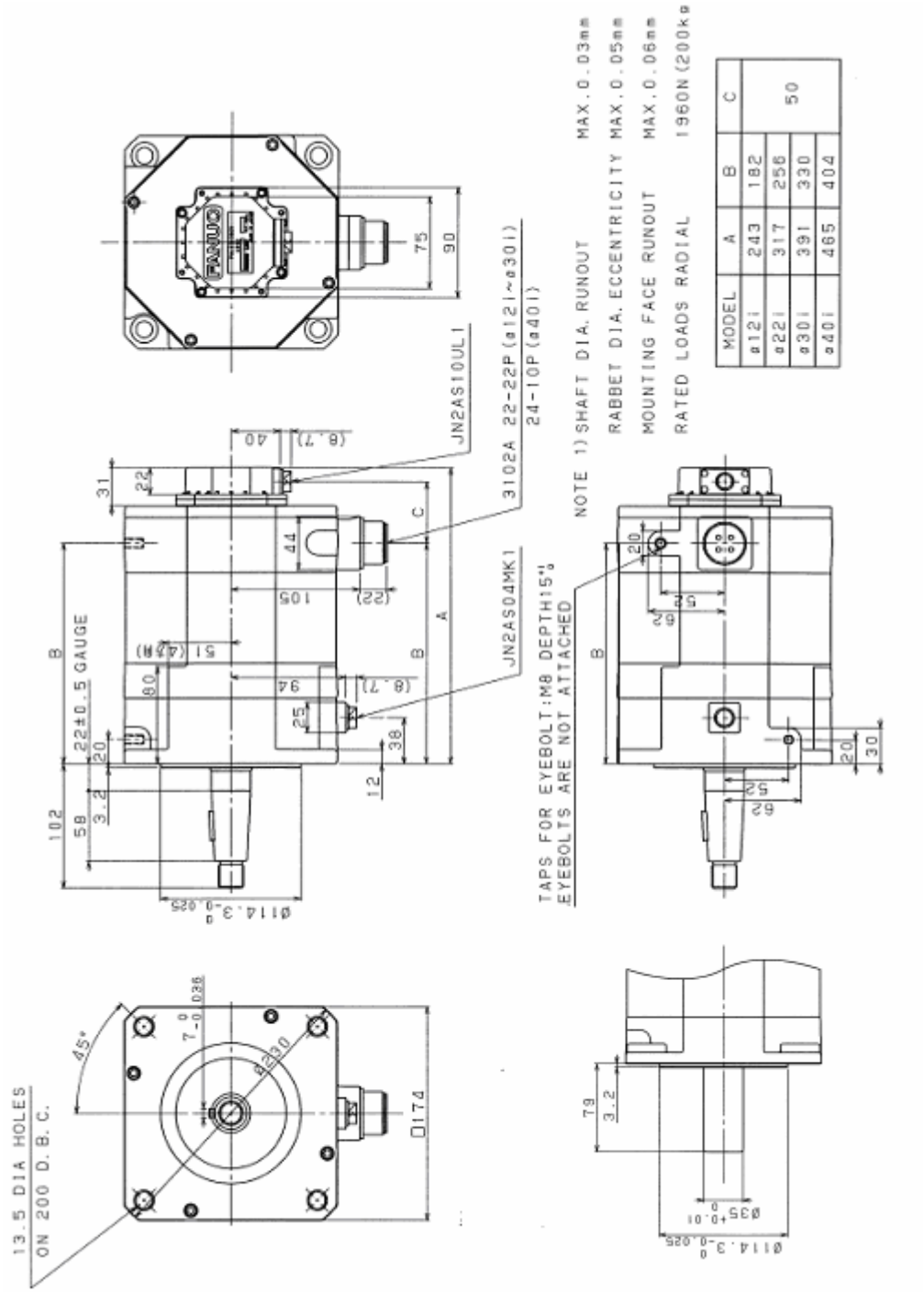
Data sheet

Parameter	Symbol	Value			Unit
Stall Torque (*)	Ts	22 224			Nm kgfcm
Stall Current (*)	Is	18.4			A (rms)
Rated Output (*)	Pr	4.0 5.4			kW HP
Rating Speed	Nr	3000			min^{-1}
Maximum Speed	Nmax	3000			min^{-1}
Maximum Torque (*)	Tmax	64 653			Nm kgfcm
Rotor Inertia	Jm	0.012 0.122			kgm^2 $kgfcms^2$
Rotor Inertia (with Brake)	Jm	0.0126 0.129			kgm^2 $kgfcms^2$
Torque constant (*)	Kt	1.20 12.2			Nm/A (rms) kgfcm/A (rms)
Back EMF constant (1phase) (*)	Ke Kv	42 0.40			V (rms)/1000 min^{-1} V (rms)sec/rad
Armature Resistance (1 phase) (*)	Ra	0.16			Ω
Mechanical time constant	tm	0.004			s
Thermal time constant	tt	60			min
Static friction	Tf	1.2 12			Nm kgfcm
Weight	w	29			kg
Weight (with Brake)	w	35			kg
Maximum Current of Servo Amp.	Imax	80			A (peak)

Z axis servo motor

α22/3000i(with brake)

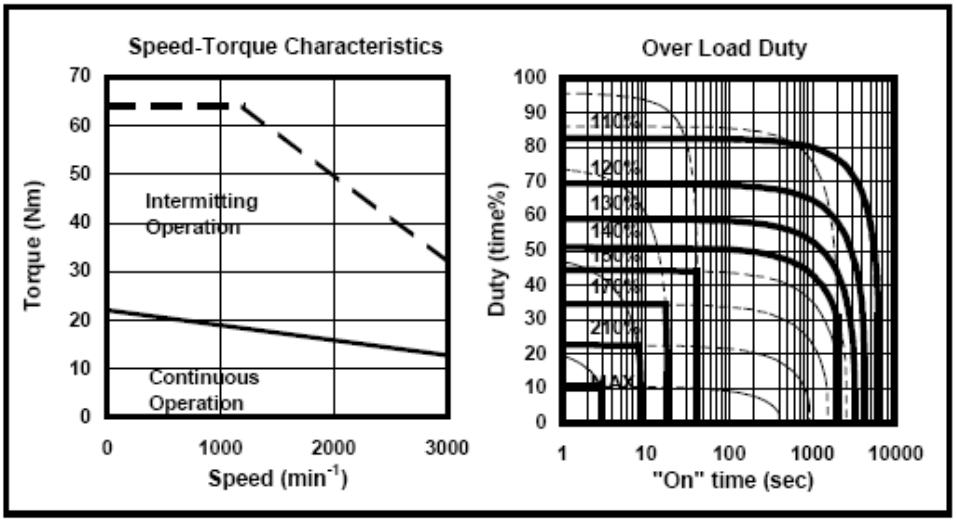
Out line



Specification

Item	Unit	α8/3000*i*	α12/3000*i*	α22/3000*i*
Output	kw	1.6	3.0	4.0
	HP	2.1	4.0	5.4
Rated torque at stall	Nm	8	12	22
	kgfcm	82	122	224
Rating rotation speed	min^{-1}	3000	3000	3000
Rotor inertia	kgm^2	0.0026	0.0062	0.012
	$kgmcms^2$	0.026	0.063	0.12
Mass	kg	12	18	29

The above values are under the condition at 20°C.



Data sheet

Parameter	Symbol	Value			Unit
Stall Torque (*)	Ts	22 224			Nm kgfcm
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Rating Speed	Nr	3000			min^{-1}
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Maximum Torque (*)	Tmax	64 653			Nm kgfcm
Rotor Inertia	Jm	0.012 0.122			kgm^2 $kgfcms^2$
Rotor Inertia (with Brake)	Jm	0.0126 0.129			kgm^2 $kgfcms^2$
Torque constant (*)	Kt	1.20 12.2			Nm/A (rms) kgfcm/A (rms)
Back EMF constant (1phase) (*)	Ke Kv	42 0.40			V (rms)/1000 min^{-1} V (rms)sec/rad
Armature Resistance (1 phase) (*)	Ra	0.16			Ω
Mechanical time constant	tm	0.004			s
Thermal time constant	tt	60			min
Static friction	Tf	1.2 12			Nm kgfcm
Weight	w	29			kg
Weight (with Brake)	w	35			kg
Maximum Current of Servo Amp.	Imax	80			A (peak)

3-Equipment

TABLE OF CONTENT

Spindle unit(Belt type)

Application

High-speed precise spindle is used on this kind of machine. The parts of spindle are made through precise process and made from stable material. The Angular Ball Bearing is assembled by professional people and technology with constant-temperature environment. This kind of spindle is suitable for high speed/light duty and low speed/heavy duty.

Adopt the Quill Type recurring coolant circuit and cooperate with high efficiently temperature controller. It makes the spindle remains constant-temperature state and create the best working accuracy.

Disk Springs and Draw Bar for clamping are adopted, so that the Spindle can combine with Cutter Arbor tightly. When the machine is executing tool-changing, the air blow holes in the middle of spindle can self-dust. Because of this, it will keep the place that combines the spindle and draw bar clean.

Air purge of spindle nose use low-pressure airflow to bring effect. When spindle is high-speed operating, the mist and dust will not permeate the bearings. By this devise, it can ensure the spindle's life.

The outside dimension and inside construction of spindle, please see the attached documents for reference.

Specification

Item	**unit**	**Note**		
Spindle mode		#40 type I	#40 type II	#50
Cone taper		7/24	7/24	7/24
Housing Dia.	mm	120	150	190
Max. speed	rpm	10,000	10,000	6,000
Bearing inner Dia.	mm	60	70	90
Lubricate		grease	grease	Grease
Clamp force	kgf	500	800	1800
Tool release gap	mm	0.7~0.9	0.7~0.9	0.9~1.2
Transmission		belt	belt	Belt
Air blow		St.	St	St
Air purge		St.	St.	St
Cooler interface		St.	St.	St.
Weight	kg	35	50	95

#40 type I spindle use on : V450/V650/V33I/V42I

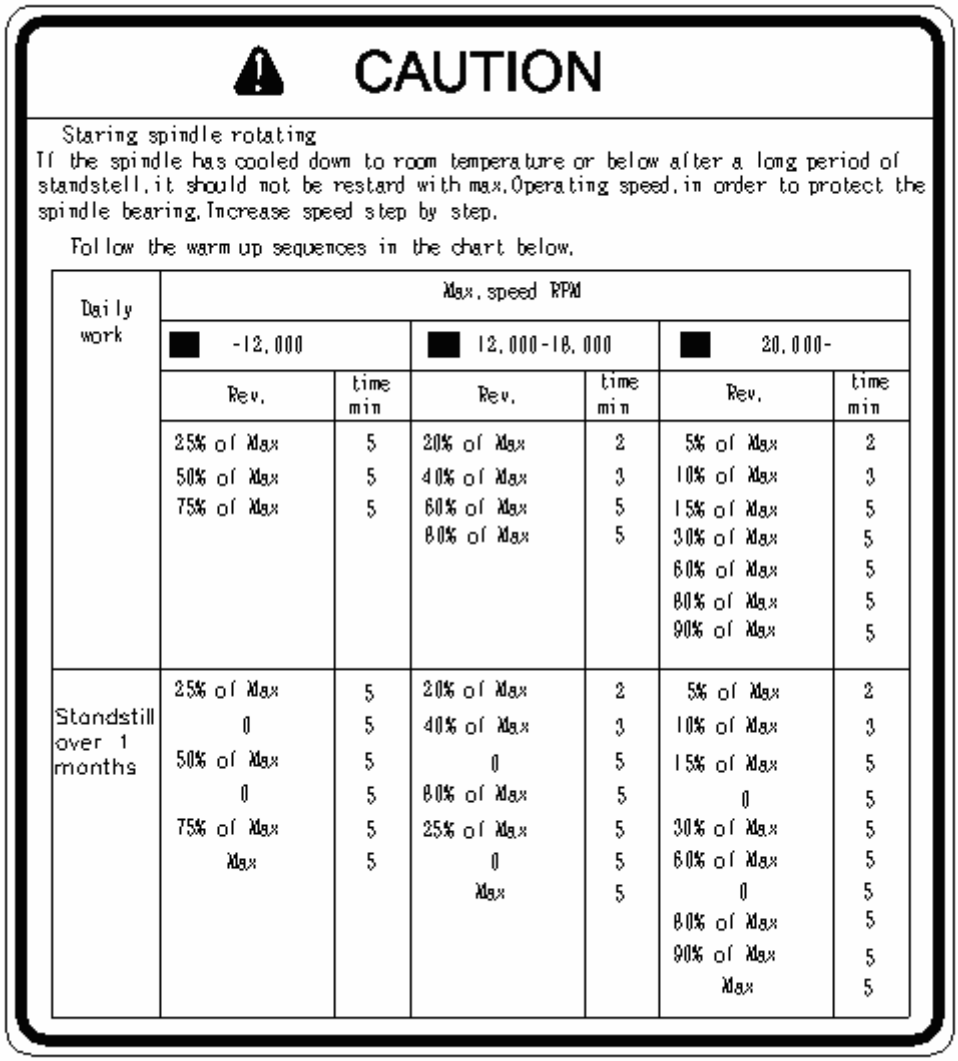
#40 type II spindle use on: V1100/MV1100S/MV1300S/MV1750S

#50 type I spindle use on : MV1100D/MV1300D/MV1750D

Warm up requirement

The spindle designed with high precision, a kind of automatic CNC machine center. For the spindle life, please before operating, follow up the table statements of spindle warming up.

Warm up table



CAUTION

Staring spindle rotating

If the spindle has cooled down to room temperature or below after a long period of standstell, it should not be restard with max. Operating speed, in order to protect the spindle bearing. Increase speed step by step.

Follow the warm up sequences in the chart below.

	Max. speed RPM					
Daily work	■ -12,000		■ 12,000-18,000		■ 20,000-	
	Rev.	time min	Rev.	time min	Rev.	time min
	25% of Max	5	20% of Max	2	5% of Max	2
	50% of Max	5	40% of Max	3	10% of Max	3
	75% of Max	5	60% of Max	5	15% of Max	5
			80% of Max	5	30% of Max	5
					60% of Max	5
					80% of Max	5
					90% of Max	5
Standstill over 1 months	25% of Max	5	20% of Max	2	5% of Max	2
	0	5	40% of Max	3	10% of Max	3
	50% of Max	5	0	5	15% of Max	5
	0	5	80% of Max	5	0	5
	75% of Max	5	25% of Max	5	30% of Max	5
	Max	5	0	5	60% of Max	5
			Max	5	0	5
					80% of Max	5
					90% of Max	5
					Max	5

Caution for operation

1. Do not rotate spindle unless the tool holder loaded into spindle already.
2. The vibration amplitude of spindle with tool is less than 18um.
3. Adjust temperature controller on the cooler to the temperature be 3~5°C below room temperature, then make sure the actual operation of oil cooler.
4. Obey the specific statements and do not excess the cutting condition of tool maker.
5. The operation time for over 8000 rpm can not exceed 3 hours in each period of 4 hours.
6. After 4 hours idle time without operating spindle, the spindle speed should be less than half speed of target speed for 5 minutes before raising spindle speed over 8000 rpm.

Maintenance

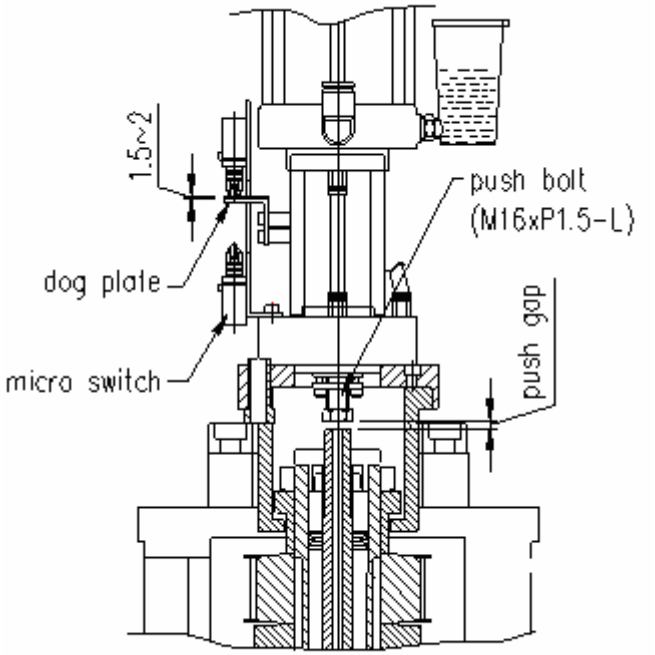
The spindle contains a draw bar witch clamps and release tool by the release cylinder and the disk spring inside of draw bar. The end of draw bar is made to clump by steel ball or collets chuck. When the tool is to be unclamp, the tool release cylinder push down to the draw bar, meanwhile, the chuck move outward, the tool release from the spindle cone. The disc spring force will supply the draw bar with pull to draw it back to the initial position. On the other hand, during tool clumping, the draw bar is acted downward and clumps the tool by the spring force.

REASONS FOR ADJUSTMENT:

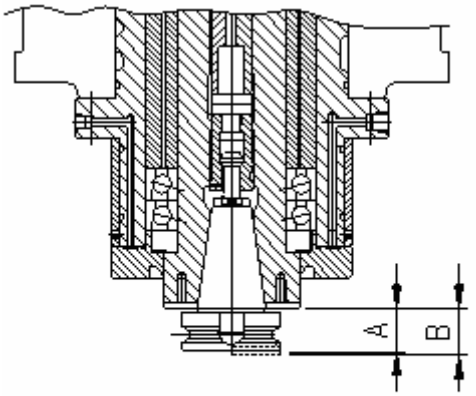
- During tool exchanging, there are malfunction between the upper micro switches and lower micro switch on the top of tool release cylinder.
- The tools pull hardly out of the spindle cone and cause tools interference.
- During tool changing, it is tool hold for delaying time.

Procedure of adjustment

1. Use the manual mode to clump the tool and measure the distance between spindle nose and flange of tool by micro scale.(refer to the drawing 2)
2. If the distance is not on require, please adjust the push gap by the bolt the bottom of tool release cylinder. Loose the nut and turn the bolt in clockwise to enlarge the gap as long as decrease the gap by turning counterclockwise. (one turn of bolt will move it 1.5 mm.) (refer to the drawing 1)
3. Check if the position is correct between the upper limit switch and the dog plate. Make sure that the limit switch should be Just on the top point on the dog whenever clamping or unclamping operation. The limit switch should have contact space at 1.5~2 mm. it will cause none malfunction or action delay during tool clamping and unclamping. (refer to the drawing 1)

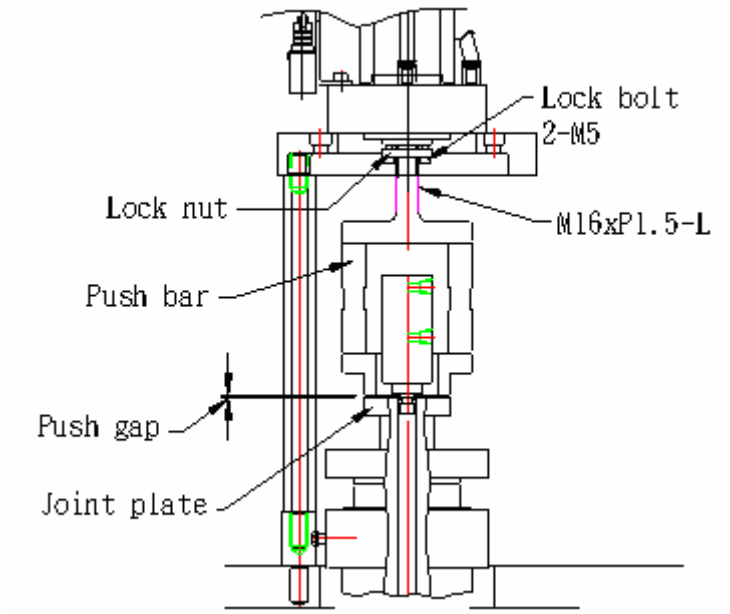


Drawing 1



Drawing 2

B-A=Tool release gap

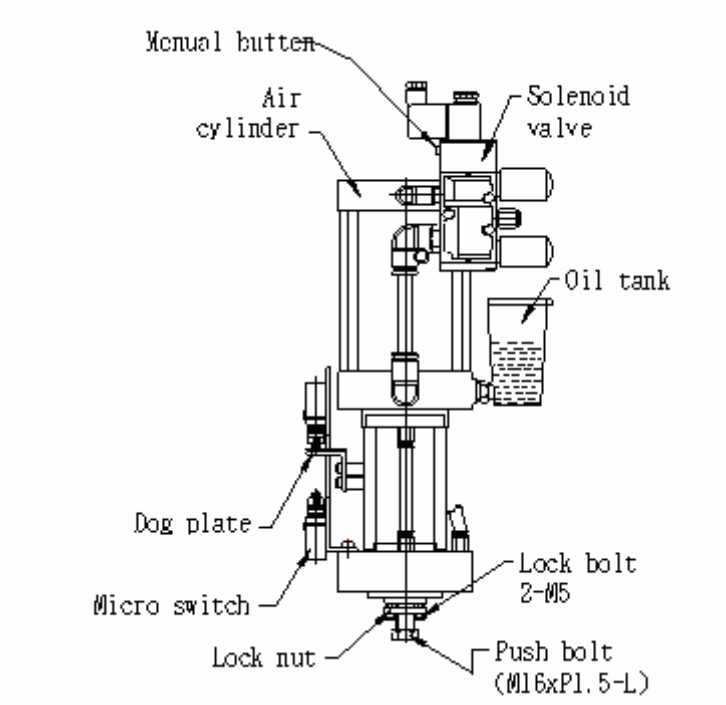


Tool release cylinder

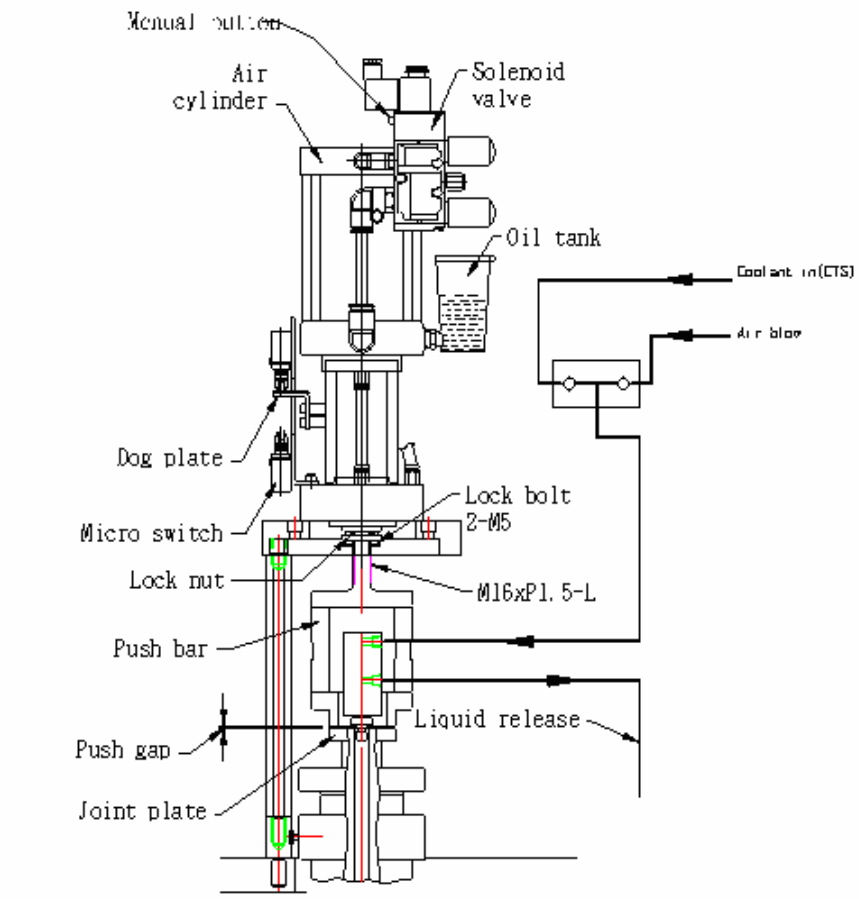
Application

Ideal way to generate huge hydraulic push force through pneumatic media. This hydraulic pushing force is as for the power source of Spindle tool released.

Out line (For belt type)



For coolant through spindle

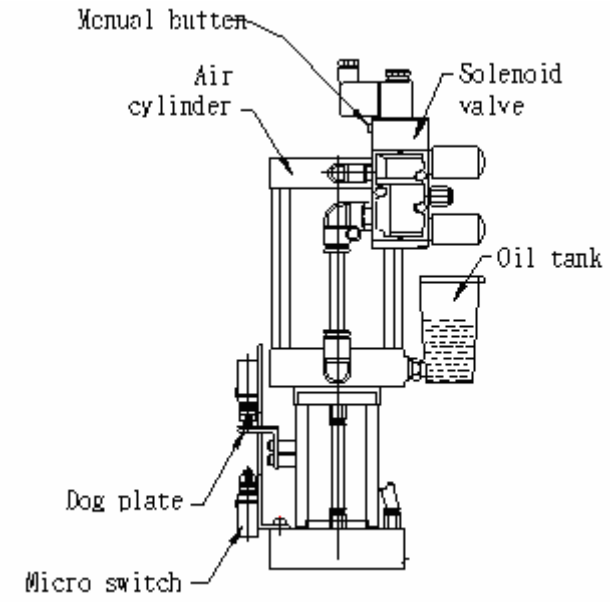


Specification

		For #40 spindle	For #50 spindle
Item	**unit**	**Note**	
Action		Air over oil	
Input air pressure	Kgf/cm^2	6~7	
Output force	Ton	2.5~3	4~4.5
Push stock	mm	13	17
Oil tank capacity	c.c.	80	
Refrigerant Oil		ISO VG 32	
Boost rate		25	39

Note: Please keep the oil leave of oil tank onto 50% full in tool release state.

Out line (For direct spindle)

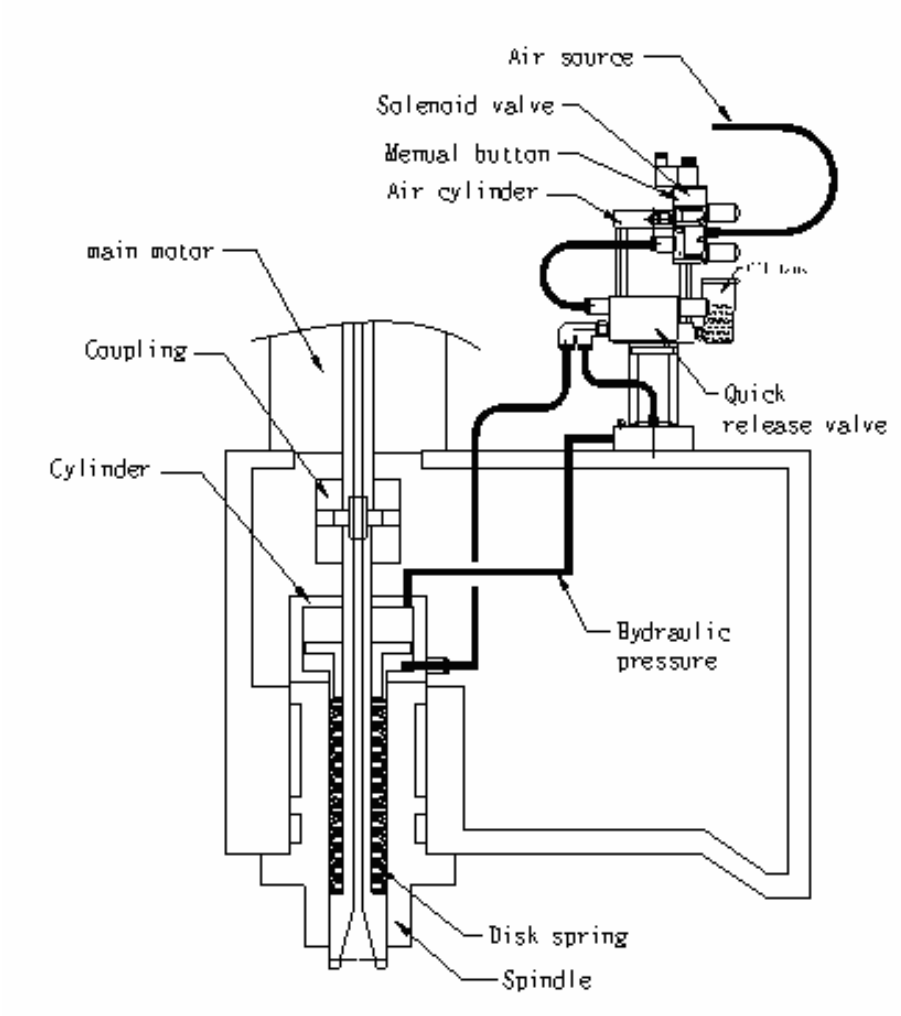


Note: Please keep the oil leave of oil tank onto 50% full in tool release state.

Specification

		For #40 spindle	For #50 spindle
Item	**unit**	**Note**	
Action		Air over oil	
Input air pressure	Kgf/cm^2	6~7	
Output force	Ton	2.5~3.5	2.5~3.5
Max outlet value	c.c.	70	120
Cylinder DIM	mm	100	100
Oil tank capacity	c.c.	80	
Refrigerant Oil		ISO VG 32	
Boost rate		12.7	12.7

Sketch drawing



Maintenance

Daily work	1. Check the oil level.
Weekly work	1. Check the connectors to see any leak or loose.
Monthly work	1. Check the oil level and refill it.
Yearly work	1. Change the oil.

Trouble shooting

Trouble	Possible reason	Solution
• Hydraulic-pressure Oil consumed unusually	• Joint leaking • Seal is broken • Pressure to low	• Tighten joint. • Change seal. • Adjust pressure
• Tool can not release	• Joint leaking • Seal is broken • Oil level to low	• Tighten joint. • Change seal • Refill oil
• Piston can not back	• Solenoid broken	• Change solenoid

- Note：First use or re-filling oil may cause the cylinder to have bubbles and become low-pressure.
- Solution:
  - Dismount the tool on the spindle.
  - Press the Manual button on the Magnetic Valve for unclamp and clamp several times. By this step, the bubbles in the tubes can be discharged.
  - Re-assemble the tool and test the function for clamp and unclamp again

Automatic tool change

Cam type automatic tool changing system

Instruction

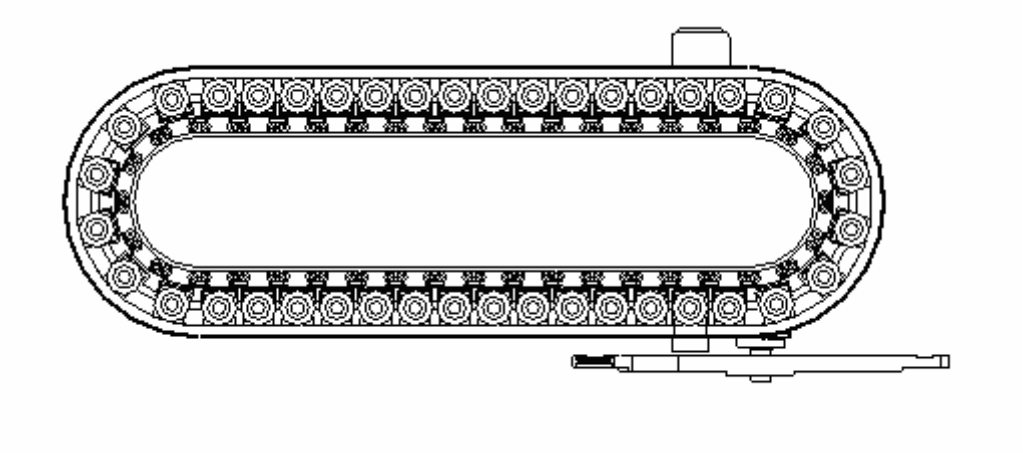
- This system is using cylindrical cam to reduce the speed by gear. The cylindrical cam is driven by a motor, which attached with automatically power-off brake to produce the indexing angle and positioning the tool pocket. When POT is on position, the pneumatic cylinder will drive the flat type cam, to make the clamping jaws goes up and down, the movement of the clamping jaws will also drive the POT to rotate horizontally or upright, and this will make the tool changing to be quick & smoothly.
- Every single rotation cycle of cylindrical cam will drive the POT for one indexing, and in every 360° rotation of the cylindrical cam, there are 270° to be the angle of movement of the cam and 90° to be the angle of non-movement. This design will help the brake motor to stop and positioning. (The rotation angle of the brake motor will be 45°±20°)
- The effective rotate angle for the clamping cam is approximately 100°, 10° plus on both the left and right side to be the angle often movement.
- The motor is 3 phases, 220V 200W.The gear reducing ration is 1:20,the attached automatic power off brake can be rotate either clockwise (CW) or counter clockwise (CCW). For every single indexing, the using time theoretically is 0.7 second, and the complete indexing cycle (24 index) will take 16.8 seconds.
- The travel of clamping cylinder is ϕ50mm ×100mm, detected by magnetic ring.
- The solenoid valve is 2 phases, 24V, 1/4”PT. (For pneumatic ATC).
- The Proximity Sensors: brand name: BALLUFF (ISO-9001) REG NO: 19279-01Specification:M12×1,detecting distance 2mmVoltage:10-30V DC ≦130mA≦800HZ PNP 3 cords.
- The material of the POT is Nylon mixture with 33% glass fiber, one piece forged, with the tolerance of the weight up to 100Kg, and the highest thermo tolerance is 120℃to -20℃.
- The counting and positioning of the rotation is controlled by PLC, through the detection of the proximity sensors, this tooling system can rotate clockwise (CW) or counterclockwise (CCW) .To execute the tool indexing by selecting the nearest path.

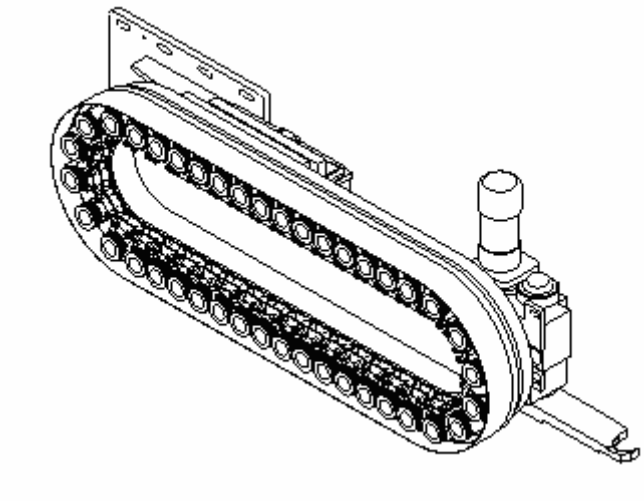
- The total weight of the automatic tool changing system, is approximately 140Kg, the clamping arm and cover excluded, (the weight of the body and tool plate is light, but still carry high rigidity, the cylinder and drive motor are located on the back side of tool magazine, to bring the convenience for maintenance & repair.)

Specification

Tool mode		ISO 40
Exchange arm type		Swim arm
Exchange mode		Random
Tools capacity	No.	40
Tool hold mode		Chain type
Tool exchange time	sec	1.5
Max. tool weight	kg	7
Max. tool length	mm	250

Out line description





Adjust arm to home position

1. According the following sketch, the tool magazine accuracy is within ±1°.
2. Because of the static angle of motor signal roller, motor needs to turn about 2.5 or 3 revolutions for taking off the conduction range. If the motor brake turns over 2.5 revolutions, it will drive the tool arm. In general the stopping range of motor brake is within half or 1 revolution and the conduction timing of proximity switches set at 5° before returning home position.
3. If motor used quite long time, the brake will be exhausted and extended the stopping range. Eventually the detector extinguished and made a false signal; therefore the NC operating will break down.
4. If there is a lot of similar situations happened neither switch problem nor electric elements broke. After checking tool arm at the tool changing position is OK then it made a conclusion that the brake motor has been exhausted. It should be replace the new one by authority service person.
5. If shrink the distance between sensor and original position of signal conductive roller, the stopping range of brake motor will become so smaller that original position deviate over range and get alarm easily.
6. Because of the varies factors for brake motor, so the supplier suggests that every two years to replace the new one to keep within ±1° of the brake accuracy.

Please refer to the following drawing

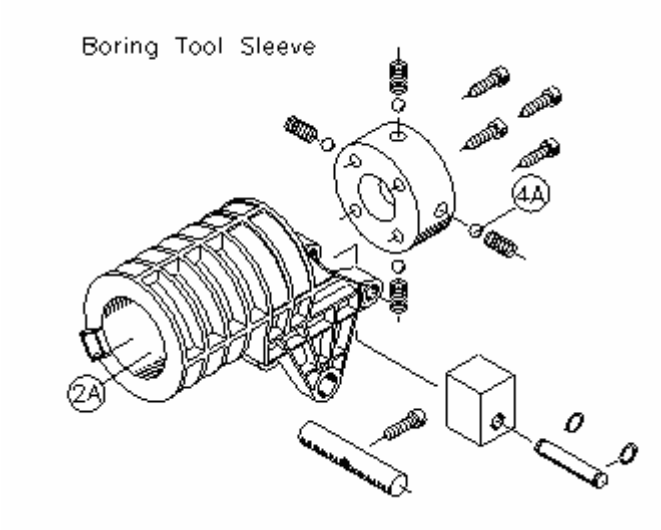
Modifying procedures of tool arm

- Pull down the clutch lever.
- Turn the tool arm to the position of tool holding angle by turning motor with the wrench.
- Adjust the tool arm to hold the tool.
- Tighten the setscrews of tool arm.

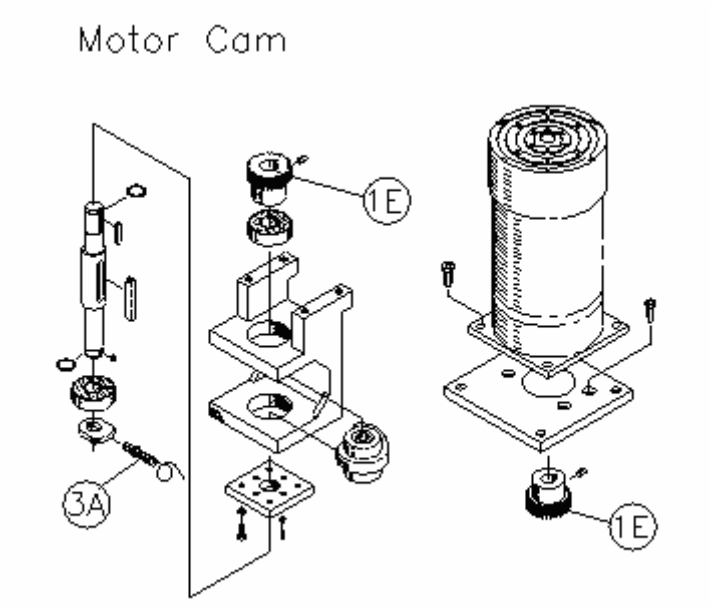
Please refer to the following drawing

Assembly drawing

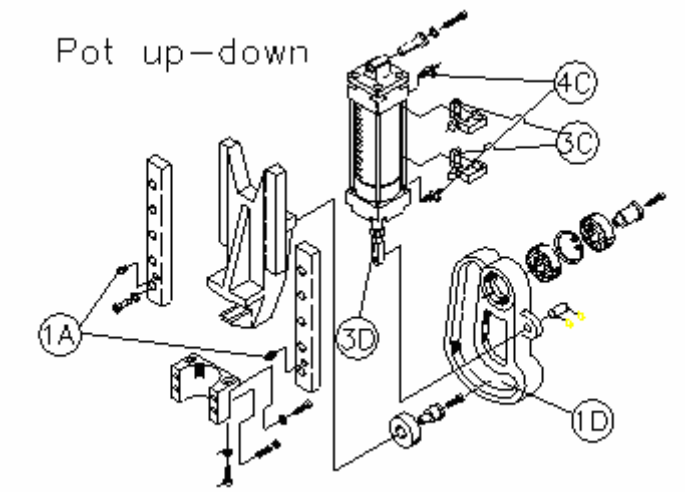
Boring tool sleeve



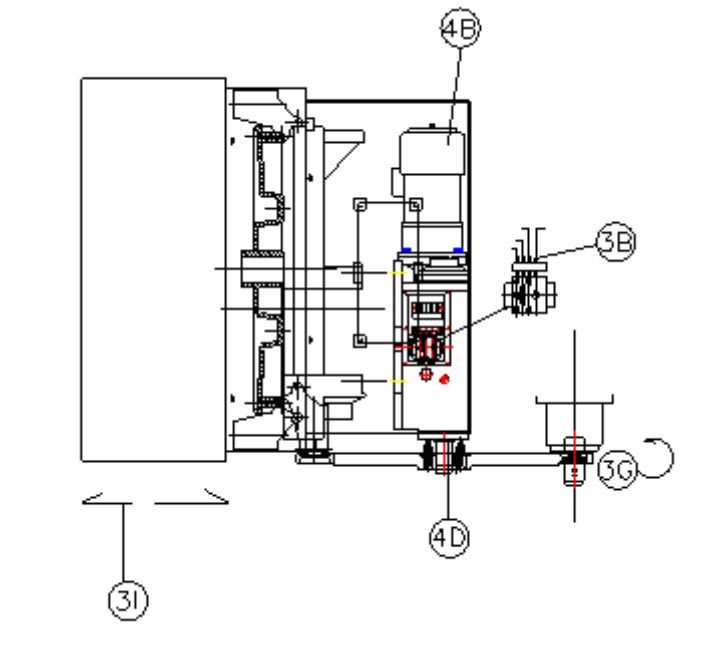
Motor drive



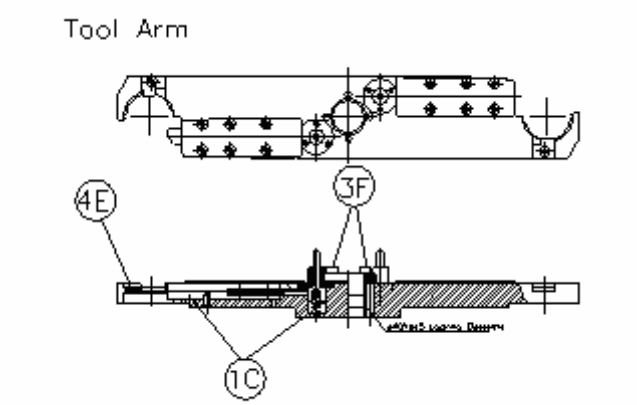
Pot down/up cam

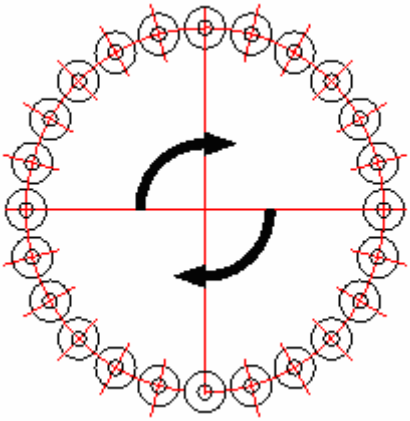
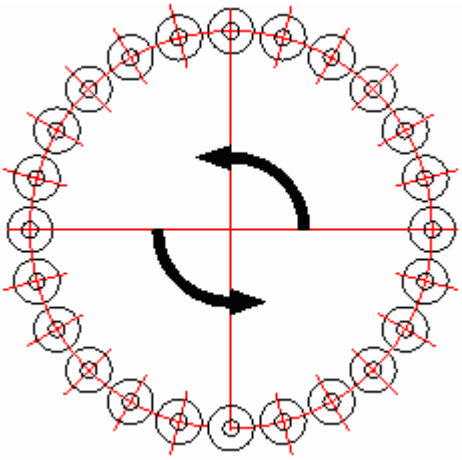
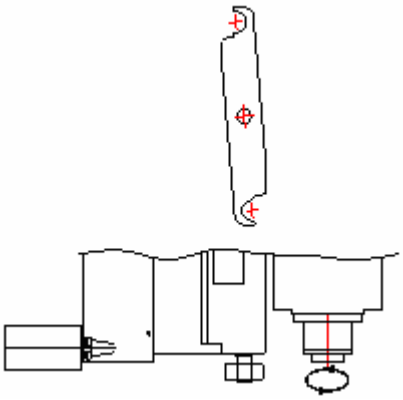
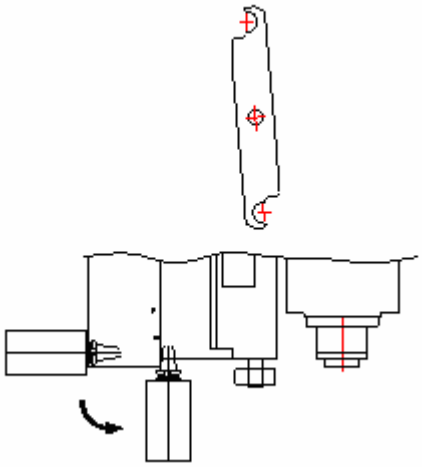
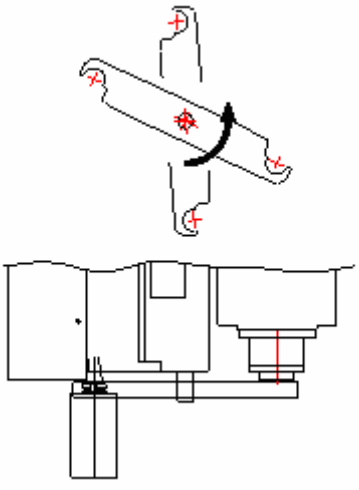


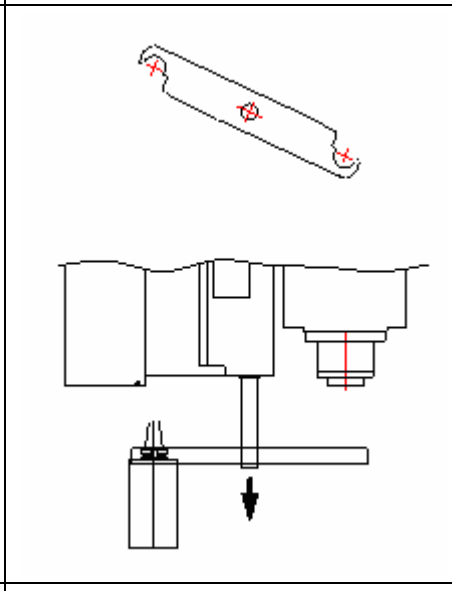
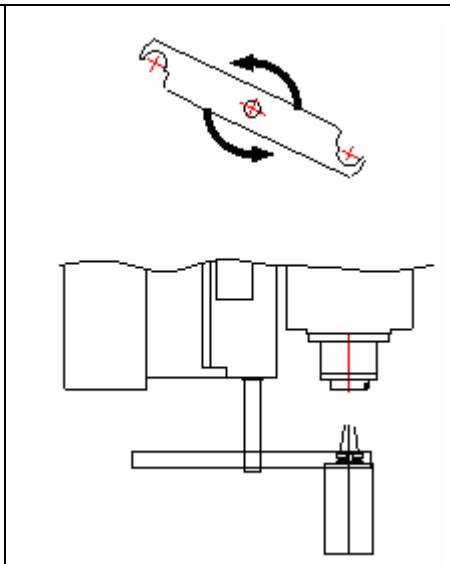
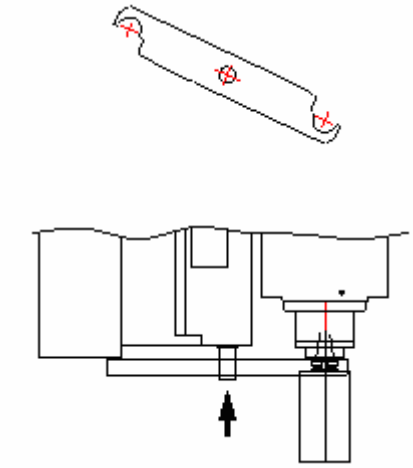
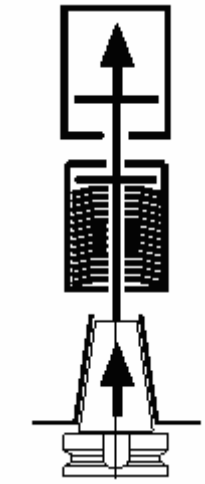
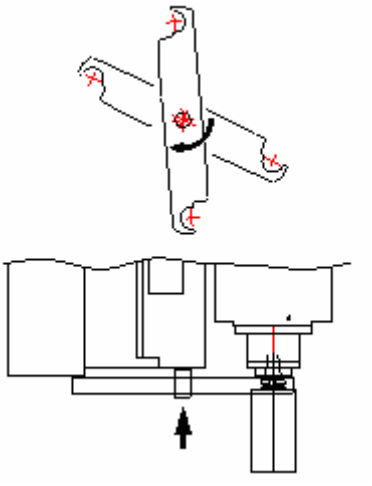
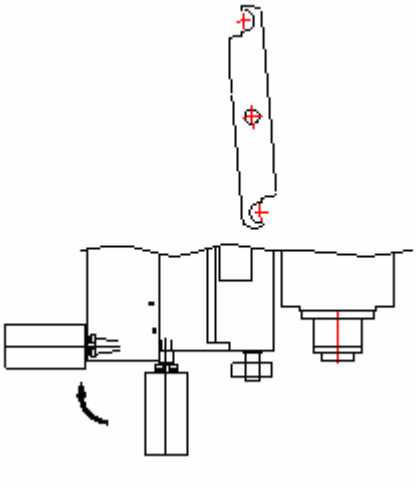
Position sensor



Tool change arm



	Cycle command	
	M6 T code Tool change cycle	
	MDI mode commend	
	[M21] Disk turning clockwise	[M22] Disk turning count clockwise
		
	MDI mode commend	
	[M19] Spindle rotation to original	[M23] Tool hold to lower position
		
	MDI mode commend	
		[M26] Tool release
		

	MDI mode commend	
		
	MDI mode commend	
		[M25] Tool clamping
		
	MDI mode commend	
		[M24] Tool hold to upper position
		

Trouble Shooting

Trouble	• Tool disk stops without positioning
Reason	1. Brake fail to work or overload 2. Sensor switch with far distance
solution	1. Please check electronic brake wiring in- correct connection or not? If the part fail to work 2. Move sensor switch closer to sensor
Trouble	• Tool disk non-stop rotating
Reason	1. Sensor switch break down 2. Sensor switch with far distance
solution	1. Replace sensor switch 2. Move sensor switch Closer to sensor
Trouble	• Pot break
Reason	1. Tool disk rotated while tool clamping
solution	1. Replace new tool pot & adjust arm Clamping position again
Trouble	• Shake during tool clamp & returning
Reason	1. Cam out lubrication 2. Cylinder speed out of balance
solution	1. Fill lubricant oil 2. Adjust cylinder pressure & speed valve.
Trouble	• Tool pot is not positioning(loosen)
Reason	1. Bolt of positioning bolt or pot bolt are loosen
solution	1. Adjust it to normal & tighten
Trouble	• Tool disk dose not work during tool selection
Reason	1. Induction switch dose not work 2. Induction switch break down 3. Motor break down 4. Electronic break bread down
solution	1. Adjust reed switch to normal position 2. Replace reed switch 3. Repair motor 4. Check wiring or sensor switch & replace

Trouble	• Cylinder does not work during tool change
Reason	1. Proximity switch for tool counter positioning is break down 2. Tool disk is not positioning 3. Cylinder has no pneumatic air 4. ATC arm does not home
solution	1. Replace proximity switch 2. Tool disk positioning 3. Check cylinder air, solenoid valve works or not? 4. Rotating motor bolt manually to let ATC arm back to original position 5. Check reed induction switch
Trouble	• ATC fail to work during tool change
Reason	1. Tool clamp positioning reed switch fail to work 2. Induction switch break down
solution	1. Adjust reed switch to proper position 2. Replace new reed induction switch
Trouble	• ATC motor over-heat
Reason	1. Brake is not released 2. Brake is break down 3. Commentator is break down
solution	1. Check commentator to electrify or not? 2. Replace brake 3. Replace commentator
Trouble	• ATC fail to work after tool clamping; • ATC fail to work after 180° degrees tool change; • ATC home stop & home • Sensor switch does not work
Reason	1. Sensor is in wrong position 2. Sensor switch is break down
solution	1. Adjust sensor to proper position 2. Replace sensor switch
Trouble	• ATC stop position out of
Reason	1. Sensor is in wrong position 2. Positioning ring of sensor switch is in wrong angle
solution	1. Adjust 3 sensor at the same time to proper angle 2. Rotate set ring, adjust 3 sensor switch to proper angle
Trouble	• ATC tool clamping position out of accuracy
Reason	1. Arm & ATC spindle are not aligned
solution	1. Loosen taper ring key & align it again

Motor of magazine replacement

1. Power off.
2. Wire off the wiring connect box of motor.
3. Take off M16 bolts (4pcs) on motor seat, and then disassembly the motor.
4. Disassembly the S18 ring & M6 bolt from damage motor & re-assembly those parts onto new motor.
5. Please make sure the motor specification is correct before you replace it.

Cylinder replacement

1. urn off the power & cylinder.
2. Take off Ø8 pipe.
3. Take off induction switch & mark original position before remove it.
4. Take off M8 bolt on cylinder.
5. Please take care to replace correct specification of cylinder before you fit it on, and then get back the induction switch to original position.

Induction switch replacement

Power off.

Disassembly the wires of induction switch in the electric box.

Please loosen the seat of reed switch & take it out.

Replace new part & take care of the sensor position, push it to upward & downward until to end of both sides.

Proximity switch of tool magazine replacement method

1. Power off.
2. Take off the front cover & outer sheet metal cover.
3. Take off the wires of proximity switch in the wire box.
4. Take off the M12 bolt on proximity switch.
5. 5.Replace new part & make sure the sensitive distance is 4mm.

Note

1. Please use standard tool during maintenance & repair.
2. We suggest you replace part, which is bought from original supplier.
3. Please take care of the part specification before replacement. You can get the specification from the part list.
4. Please make sure the sensitive distance during replace proximity switch & reed switch.
5. Please take care the wire numbers & location in case you have to replace the wire connecting.
6. In any case of abnormal or damage condition on the product, there should be someone checking the product. We strongly ask the service man has to be well trained & qualified engineer or expert come to check or repair the problem. This is to ensure safety of operator & engineer.
7. Before disassembly the product, please make sure there are enough human beings to support the load. If there are not enough human beings, please use lifter, crank or any other carrier to support the weight.

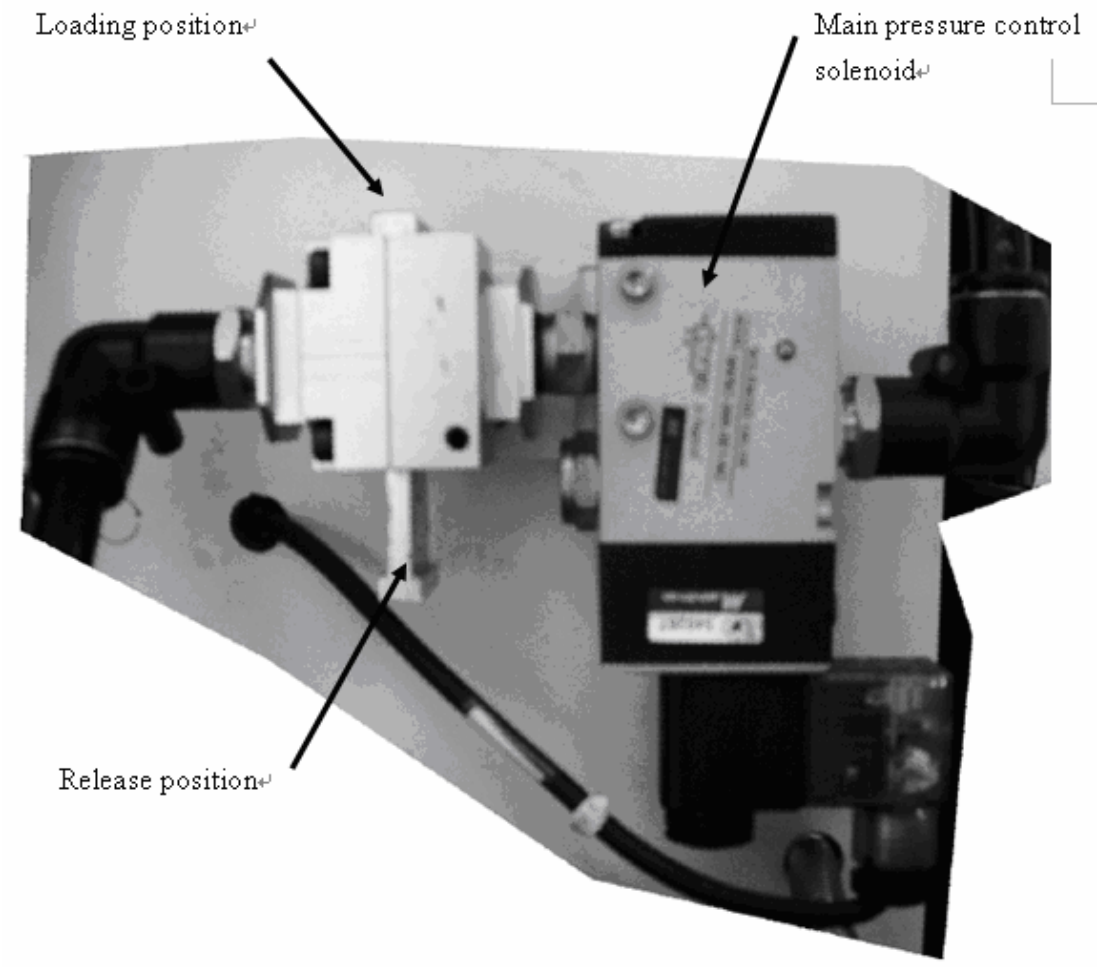
Pneumatic system

Application

Air Pressure Unit is the source of power to drive the air-pressure equipments, such as spindle unclamp, tool pocket motions and air blowing...etc.

In the factory, the device that providing air pressure needs the functions of pressurization, dust-sweeping, water-sweeping...etc., so that they can raise the reliability of long-term operation for machine devices.

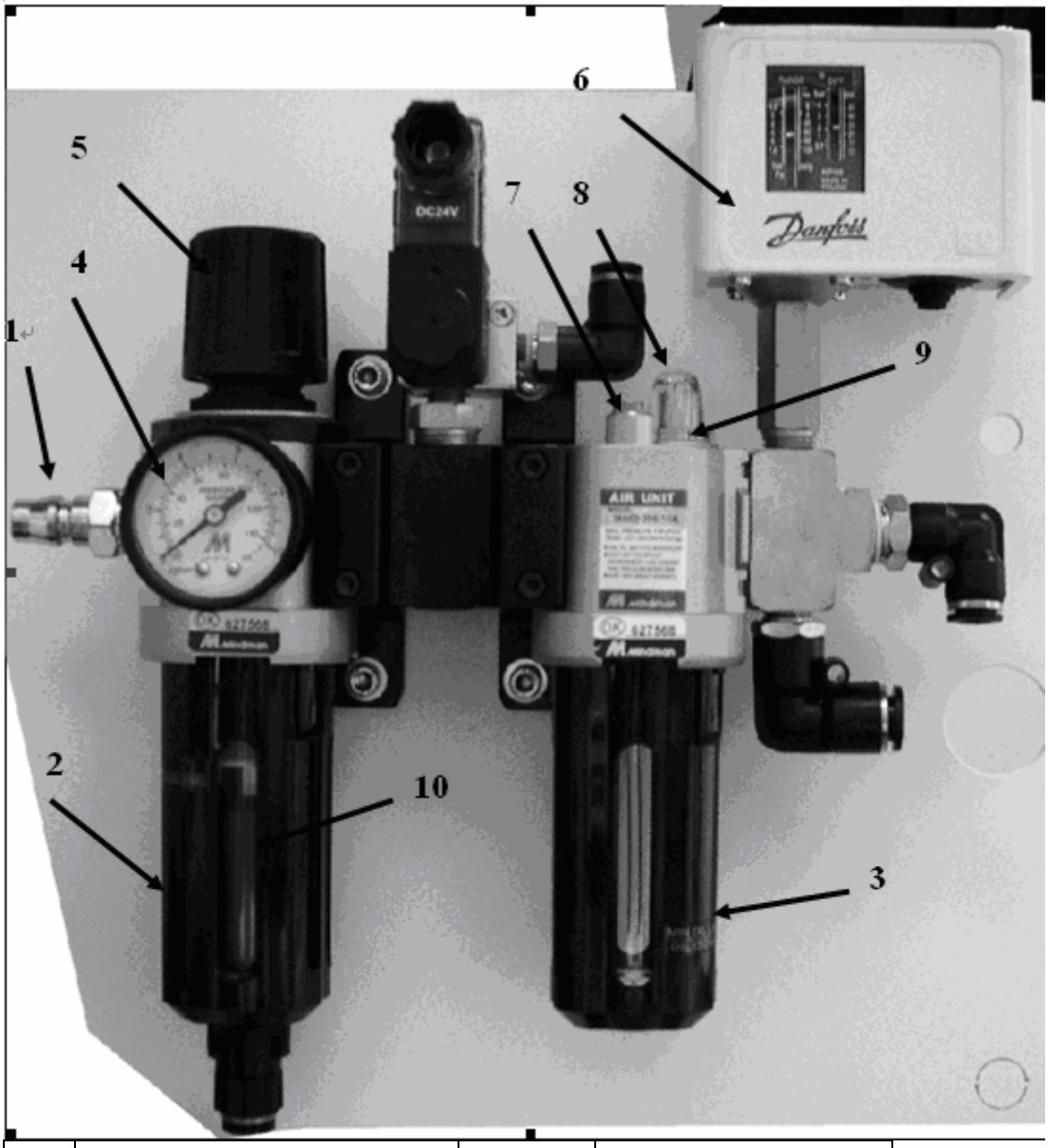
Safety control(CE request)



⚠ CAUTION

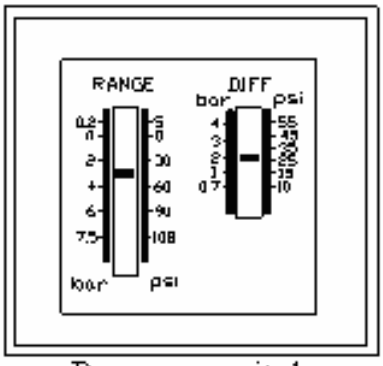
- Push the air pressure release valve to release position before to do any service work.

FRL unit out line



NO	Name	Unit	Regulation
1	Pneumatic source entrance	kgf/cm^2	6~7
2	Air fillter	u	5 micro
3	Lubrication oil tank	c.c	50-ISO/VG22
4	Pressure gauge	kgf/cm^2	6~7
5	Adjust knob		
6	Pressure control switch		
7	Oil flow adjust knob		
8	Oil floe watch view	l/min	60
9	Oil entrance		
10	Auto drain valves		automatic

Pressure control switch adjusting



Pressure switch

Range setup:4~4.5 bar

Diff setup: around 2 bar

Check point before operation

1. Check pressure supply before adjusting and check the air pressure gauge.
2. Adjust as necessary, what with watch the pressure gauge and clockwise rotation of the knob results in a pressure increase or counterclockwise turn will reduce the pressure.
3. Check the lubricator tank oil level and refill it.
4. Check the pressure switch setting is on factory setting.

⚠ CAUTION

- The pressure setting between 6~7 kg/cm^2.
- Air pressure required: 8 bar before regulator, 6 bar after regulator, 400 l/min momentary.
- Push the air pressure release valve to release position before to do any service work.

Maintenance

Daily work	2. Check the pressure and adjust pressure.
Weekly work	1. Check pipe and connectors to see is there any leak or loose. 2. Check the oil level and re-fill the oil
Monthly work	1. Check the filter
Half year work	1. Change the filter

Note:

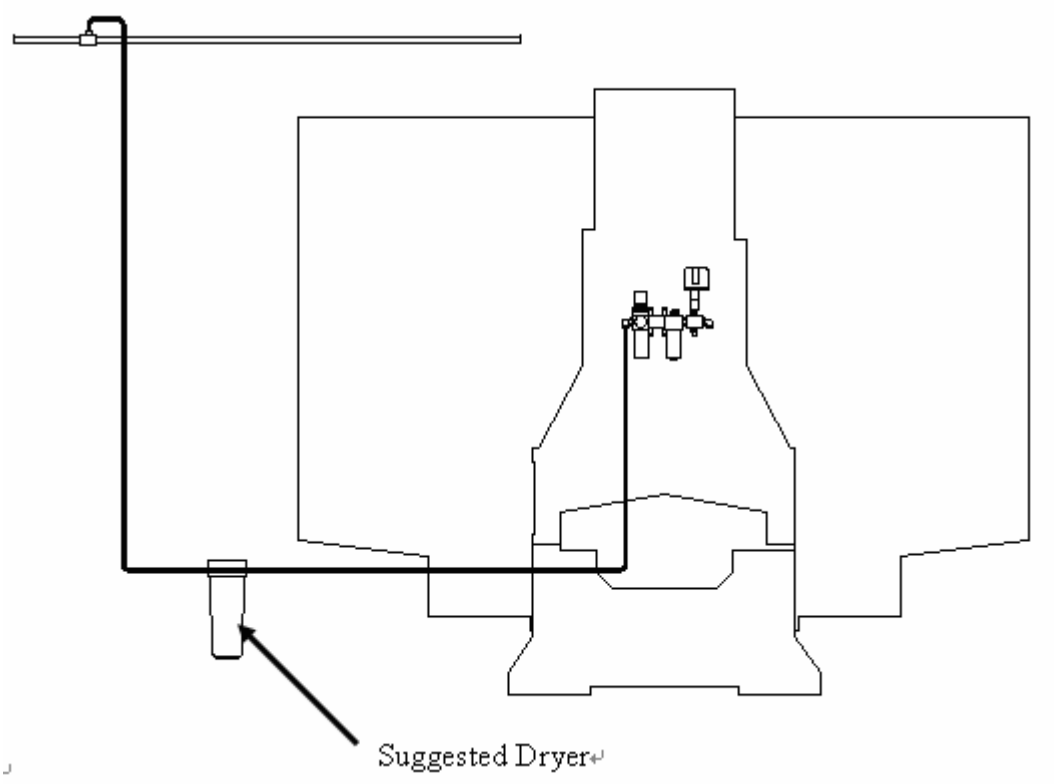
From the main air supply line attach a 10 mm air supply line for machine. The distance from the air compressor and number of machines attached should be taken into consideration when determining the size of piping for the main air supply line.

Piping may consist of one or more of the following: galvanized pip, PVC pipe or high pressure hose. Do not use quick disconnects; quick disconnects will restrict air flow.

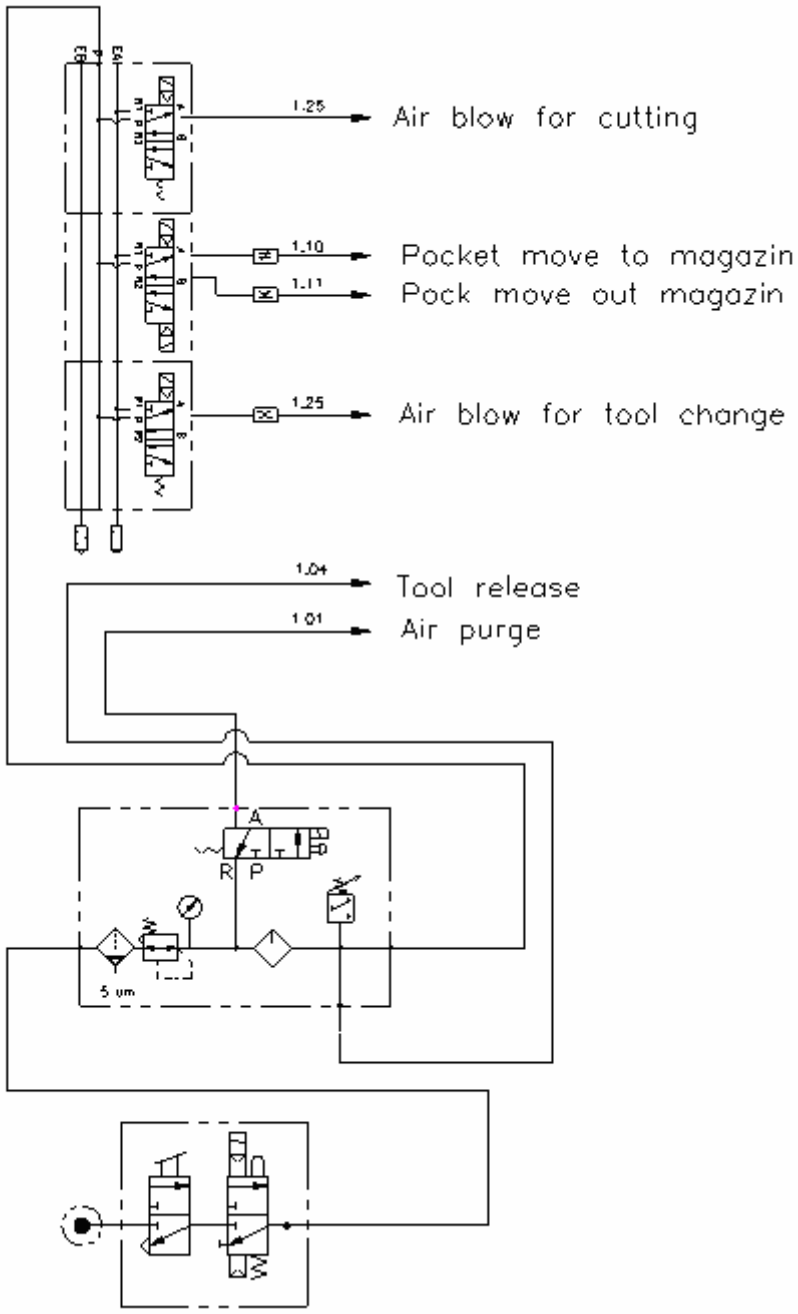
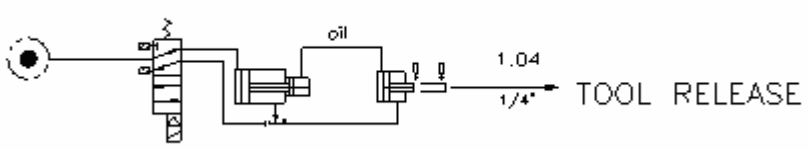
A"T" riser should be used to connect the main air supply line with the air supply line to machine.

To prevent moisture from entering the machine air system, attach a drain to the lowest point of the air supply line. The drain could be a self-relieving moisture separator, a simple petcock, or a gate valve opened occasionally to release the water build-up. An air dryer is preferred where higher moisture levels exist.

To help prevent contaminants from entering the air system on the machine, place a filter in-line on the main air supply line.



The route sketch drawings following the end of book.

	The sketch of pneumatic system
	V serious
	
	Power cylinder for tool release
	

Lubrication system

Application

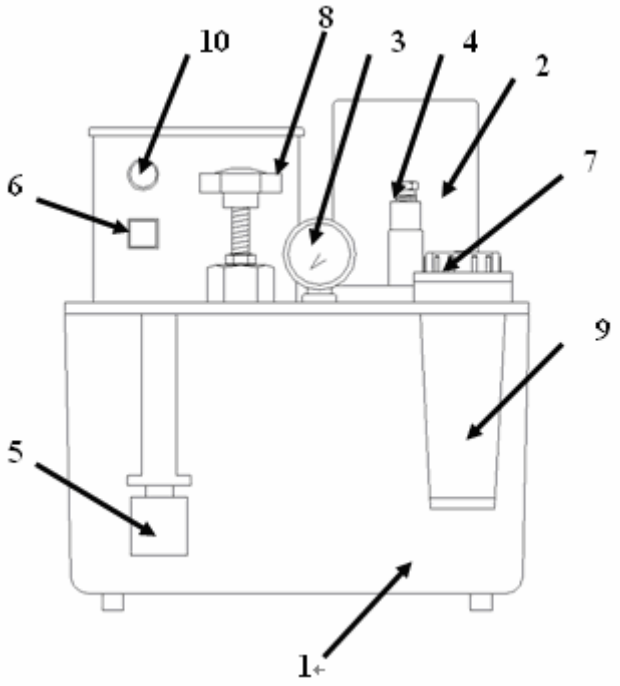
The slide way and liner way of machine are in headstock and table, saddle and the X,Y, Z axis ball screw, those areas need to be lubricated and all supplied by the lubricating pump located at the rear side of this machine.

When we turn on the machine power the auto lube will be started automatically and it will pump the lubricant to the areas mentioned above every 15 minutes. Every shot of oil will last 30 seconds. It can be adjusted if necessary, please refer to the operation manual.

Specification

Item	**Unit**	**Note**
Discharge capacity	Cc/min	0~200
Discharge pressure	Bar	0~20
Pump power	KW	0.25
Volt		3 phase/220V
Oil mode		ISO VG 68
Setting pressure	Bar	10~12
Pressure protection device		yes

Outside appearance



NO	Name	NO	Name
1	Oil tank	6	Push button
2	Pump	7	Oil inlet
3	Pressure gauge	8	Adjust value
4	Entrance	9	fillter
5	Oil level gauge	10	Lamp light

7

9

Check point before operation

- Always sure proper, fresh lubricant and similar to viscosity(32-68 cST/40° C)
- The oil reservoir should always preserve clean lubricant and does not use recycle oil.

Caution for operation

- The indicated lamp will light on if lubrication system operating normal.
- Turn the adjustable valve with CW to increase pressure and with CCW turn to decrease pressure.

Maintenance

Daily work	3. Check the oil level and re-fill the oil 4. Check the pressure(push the button)
Weekly work	1. Check oil pipe and connectors to see is there any leak or loose.
Monthly work	1. Clean the filter

⚠ CAUTION

When we have the following situation please hold on the push button for 10~15 seconds, this action should repeat 3 times, because for a long time no operation, the lubrication is very little.

When

1. The machine is first time set up
2. Long time no operation.
3. Everyday before operation.

We should do this lubricating operation, go around and begin again 3 times when hand off the pump will stop automatically.

We should re-fill from the oil entrance every day. When the oil level goes down to 1/4, the operation panel will show “LUBE ALUMN”

Trouble shooting

Situation	Cause	Remedy
Pump can not work	1. There is some foreign particles in 2. The viscosity of oil either too high or too low.	1. Disassemble the pump and take away the foreign particle 2. Use suitable viscosity oil
Pressure to lower	1. The pressure not setting 2. The joint or pipe leaking.	1. Adjust pressure 2. Tighten joint or change pipe.

⚠ WARNING

The control lubricator system is always has strong influence to the machine accuracy and life of operation, so please take good can of operation and maintenance.

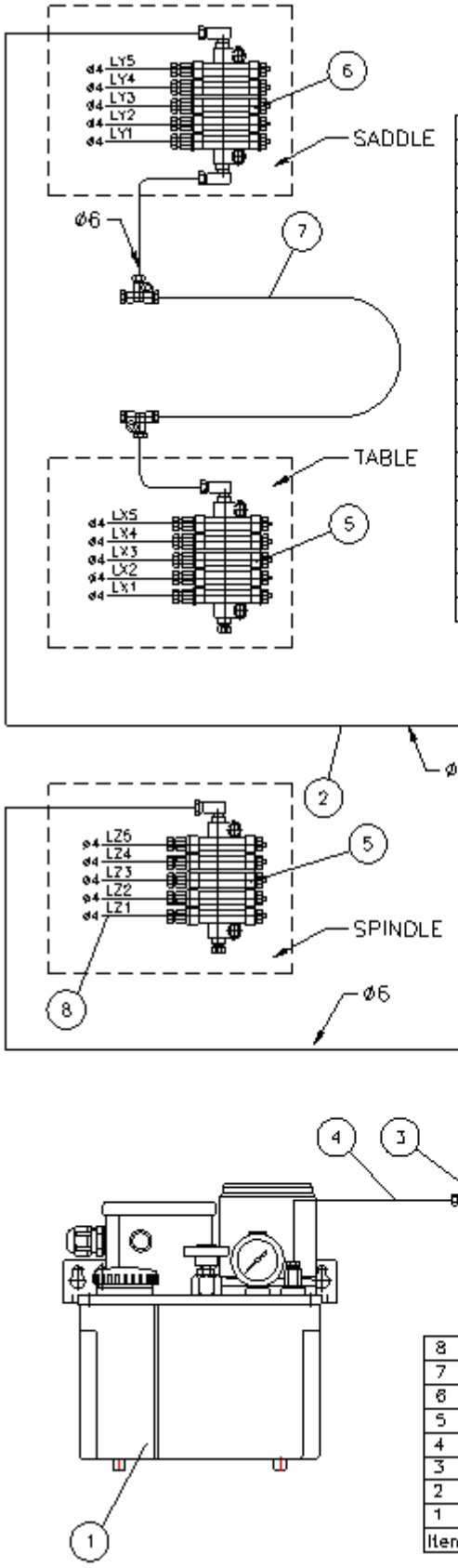
The normal working condition is in the temperature of surrounding at 5-60° please do not over it or below it and please do not let the sun shine impinge on the machine directly.

Max. Operating pressure should not over 12 kgf/cm^2 (170 PSI)

The route sketch drawings following the end of book.

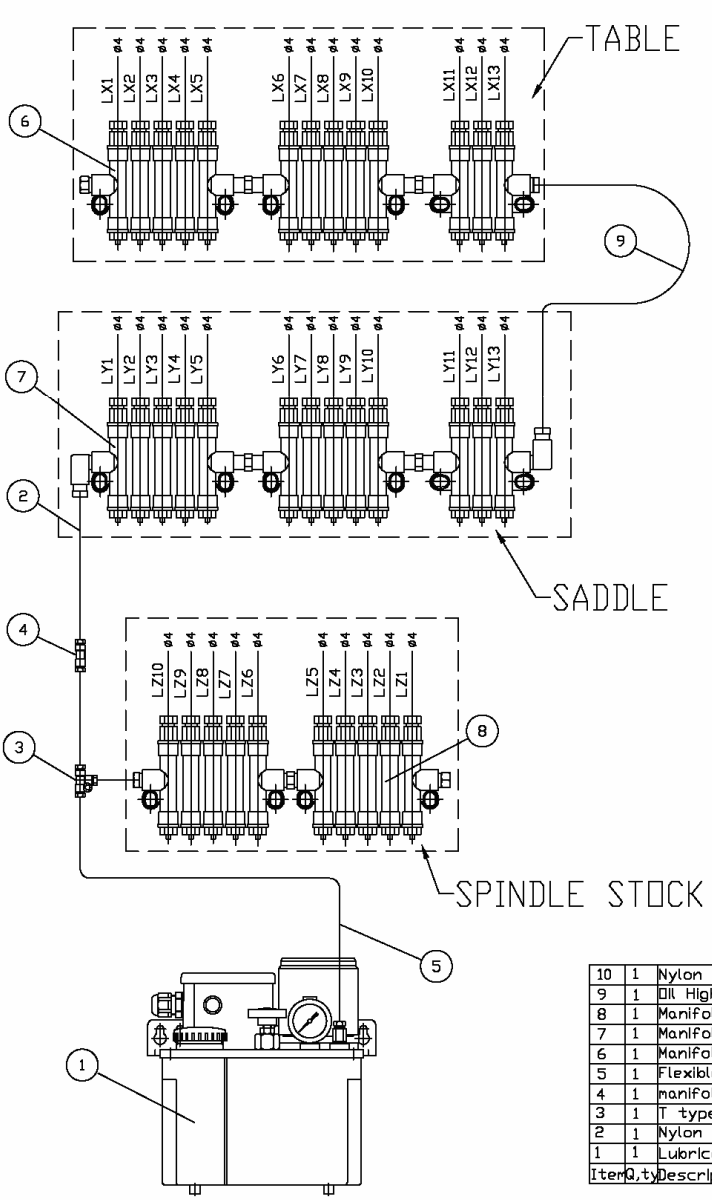
The sketch of lubrication system

V 450/V 650/V 33i/V 42i/V 1100



Number	Content	cc/cycle
LX1	X axis allde block	0.1
LX2	X axis allde block	0.1
LX3	X axis slide block	0.1
LX4	X axis slide block	0.1
LX5	X axis ball screw	0.2
LY1	Y axis slide block	0.1
LY2	Y axis slide block	0.1
LY3	Y axis slide block	0.1
LY4	Y axis slide block	0.1
LY5	Y axis ball screw	0.2
LZ1	Z axis slide block	0.1
LZ2	Z axis slide block	0.1
LZ3	Z axis slide block	0.1
LZ4	Z axis slide block	0.1
LZ5	Z axis ball screw	0.2

Item	Q.ty	Description	Spec.
8	1	Nylon Hose	ø4
7	1	Oil High-Pressure Hose	4180018100
6	1	Manifold-5	398700840
5	2	Manifold-5	398700740
4	1	Flexible metal hose	4190060600
3	3	T type manifold	3 Joint
2	1	Nylon Hose	ø6
1	1	Lubricator	CEVB-03



Number	Content	cc/cycle
LX1	Gib seat	0.1
LX2	Gib	0.1
LX3	Box way	0.2
LX4	Gib seat	0.1
LX5	Datum	0.1
LX6	Box way	0.2
LX7	X axis ball screw	0.2
LX8	Box way	0.2
LX9	Datum	0.1
LX10	Gib seat	0.1
LX11	Box way	0.2
LX12	Gib	0.1
LX13	Gib seat	0.1

Number	Content	cc/cycle
LY1	Gib seat	0.1
LY2	Gib	0.1
LY3	Gib seat	0.1
LY4	Box way	0.2
LY5	Box way	0.2
LY6	Gib	0.1
LY7	Y axis ball screw	0.2
LY8	Datum	0.1
LY9	Box way	0.2
LY10	Box way	0.2
LY11	Gib seat	0.1
LY12	Gib seat	0.1
LY13	Gib seat	0.1

Number	Content	cc/cycle
LZ1	Gib seat	0.1
LZ2	Gib seat	0.1
LZ3	Box way	0.2
LZ4	Datum	0.1
LZ5	Z axis ball screw	0.2
LZ6	Gib	0.1
LZ7	Gib	0.1
LZ8	Box way	0.2
LZ9	Gib seat	0.1
LZ10	Gib seat	0.1

Item	Q,ty	Description	Spec.
10	1	Nylon Hose	ø4
9	1	Oil High-Pressure Hose	4180018122
8	1	Manifold-10	3987021A0
7	1	Manifold-13	3987020B0
6	1	Manifold-13	3987019A0
5	1	Flexible metal hose	4190060600
4	1	manifold(2 joint)	4240420006
3	1	T type manifold(3 joint)	4240430006
2	1	Nylon Hose	ø6
1	1	Lubricator	CEVB-03

Cooler system

Application

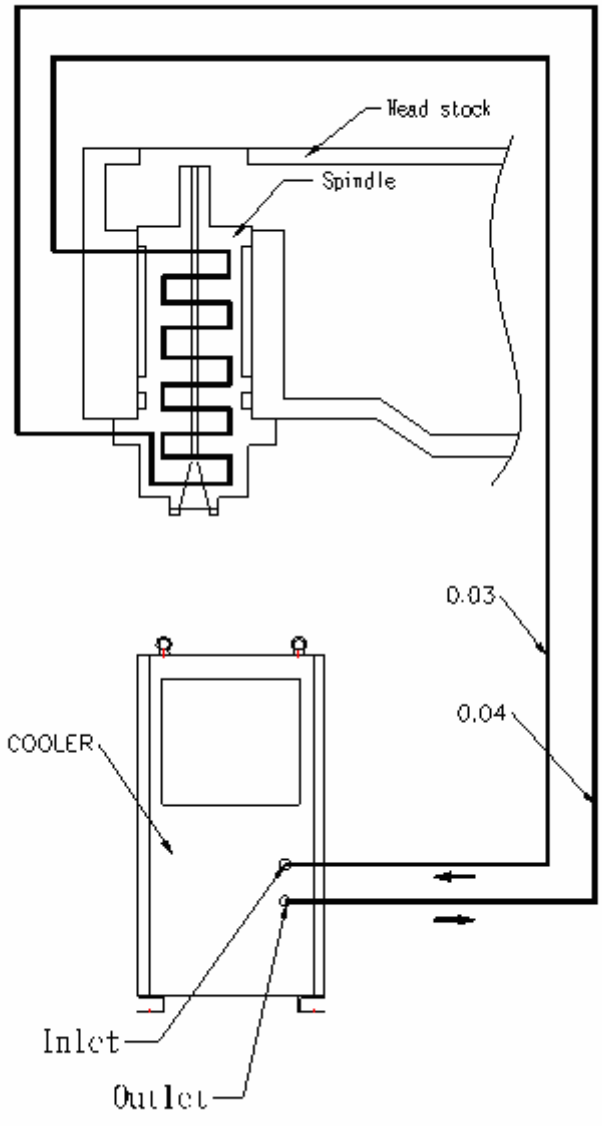
This cooler series is designed specifically to remove heat generated in the spindle and gear box of CNC machine centers.

The following charts indicate the operating oil/liquid temperature for various ambient room temperatures in order that precision of the finished work piece is obtained.

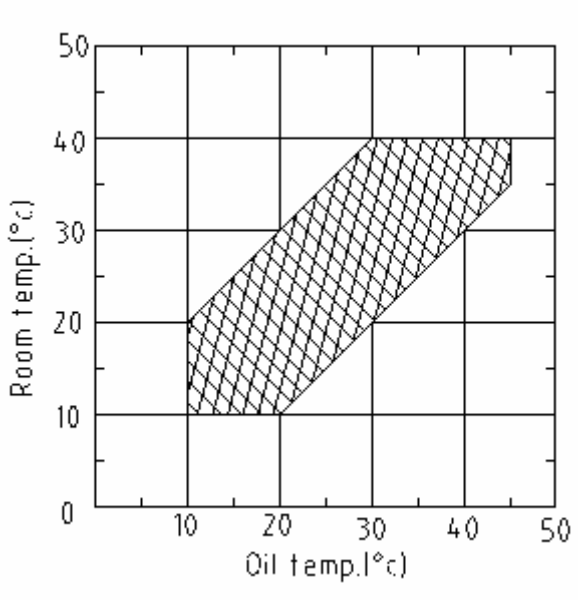
The cooler is designed with built in protection for compressor and electrical part while the voltage tolerance +/- 10%。

Frequency tolerance +/- 1˚C

The sketch of cooler system



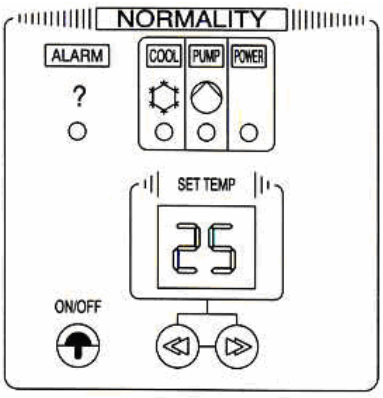
Effect area drawing



SPECIFICATION

Item	**unit**	**specification**
Cooling capacity	BTU/hr Kcal/hr	4000 1000
Power source	V	AC 220V/380V 3 φ 50/60 Hz
Oil pump power	HP/KW	0.25/0.19
Total current	A	3.8
Inlet and outlet bore size		1/2”x1/2”
Oil pump flow rate	Litter/min	4.5
Refrigerant		R-134a
Oil tank capacity	Litter	20L
Refrigerant Oil		ISO VG 32
Temp setting range	˚C	+9.9~-9.9

Monitor display control panel



Operation and function of control panel

NO.	ITEM		OUTLINE	OPERATION&FUNCTION
1	Set keys	ON/OFF SWITCH		Run/Stop Switch.touch type
2		SET TEMPERATURE		Usually display liquid temp,after pressing the temp setting key, monitor will twinkle and display the setting temp. In the mean time,use setting key to set temp.
3	Working keys	POWER ----green lamp		Power Source lamp Show the cooler is with electricity
4		PUMP ----green lamp		Pump is running normally
5		COOL ----green lamp		Compressor is running normally
6	ALARM	BREAKDOWN ALARM LAMP	?	Cooler is unusual

Board setting function

1. When ALARM LED lights up, it indicates pump overload switch、flow switch、pressure switch or compressor overload switch is unusual. Please check if the switch is turnoff, to reset it and refer remedy method from manual, to clean the filter, etc. To avoid ALARM again.
2. When ALARM LED lights up and RE is displayed, it indicates power phase is error. Please check the wiring connections. If you are using a single phase power source, please adjust the “3” of S4 DIP-SW to the position OFF on the electric board.
3. When ALARM LED lights up and O.S. is displayed, which mean oil/water (SENSOR) is unusual.
4. When ALARM LED lights up and R.S. is displayed, which mean room temperature (SENSOR) is unusual.

Check point before operation

1. When the power source is turned on , check to the power lamp is light up.
2. Push the ON/OFF key to light up the power lamp.
3. Check that the oil level is at lease at 80% level of the oil tank.
4. Check that the outlet and inlet of the oil tank is tightly secured.

Caution for operation

1. Avoid running the pump without oil.
2. When the pump is run in, the compressor shell run in about 30 seconds later.
3. Do not turn ON/OFF the cooler repeatedly. Otherwise, that would cause cooler stop, and the overload switch may trip. When this happens, it is necessary to take 2-3 minute break then the compressor start again.

Caution for temperature setting

⚠ WARNING

1. We set the differential temp. between -3~-5° C。Do not over -7° C。
2. Setting protection for low temp. is 23° C, the compressor will stop running when liquid temp. Low the setting value.
3. Please raise the setting temperature while the water congealed from pipe or spindle out flange.

Maintenance

Daily work	1. Check the oil level. 2. Check the temperature setting
Weekly work	1. Clean the filter by brush or compressed air. 2. Check oil pipe and connectors to see is there any leak or loose.
Monthly work	1. Wash the filter. 2. Clean up the dirt on radiator of oil cooler with compressive air.
Yearly work	1. Change the oil.

Trouble shooting

Situation	1. Power lamp is off
Cause	1. LED burnt. 2. PCB board fuse blown 3. Transformer burnt 4. Wire 18,19 loose connection
Remedy	1. Replace PC board 2. Replace fuse 3. Replace transformer 4. Reconnect wire 18 & 19
Situation	REV is lighted
Cause	1. 3 phase power reverse 2. Pressure reduction and differential value of 3 phase is above ±10%
Remedy	1. Switch any 2 of the R.S.T wires 2. Stability power source
Situation	OPS is lighted
Cause	1. Inlet oil pipe is clogged or loosened 2. Inlet & outlet are reversed 3. Pump motor runs reverse 4. Pump can not run 5. Circulation oil is not enough

	6. Oil filter is dirty 7. Oil pressure switch breakdown
Remedy	1. Check, clean and lock pipe 2. Correct position of in/outlet 3. Check over-relay of 51p red and white lines 4. Replace oil pump 5. Supply circulation oil 6. Replace new filter 7. Adjust oil pressure switch DIFF, 0.3 kgf/㎠, range 0.5~0.8 cmHg
Situation	PUMP is lighted
Cause	1. Overload relay is off 2. Pump switch is off 3. Inlet pipe is
Remedy	1. Reset switch 2. Reset pump switch 3. Clean pipe and
Situation	HP is lighted
Cause	1. Condenser is too dirty 2. Air filter is not clean 3. Cooling fan doesn't run or blades fall off 4. Cooling medium pressure switch breakdown 5. Cooling medium is leaking
Remedy	1. Use compress air to clean fins and restart cooler 2. Clean filter 3. Lock fan blades tightly or replace fan motor 4. Replace cooling medium pressure switch 5. Irrigate cooling medium.
Situation	RA is lighted
Cause	1. Room temp. Sensor breakdown
Remedy	1. Replace RA sensor
Situation	RO is lighted
Cause	1. Oil temp. Sensor breakdown
Remedy	1. Replace RO sensor
Situation	OT is lighted
Cause	1. Oil temp. is to high 2. Temp. sensor blown Checking cooling medium is enough or not
Remedy	1. Stop running cooler until oil temp. Returns to normal range. Start again 2. Replace temp. sensor

	Supply cooling medium

⚠ CAUTION

Lack of cooling medium (the refrigerant)

The following condition is caused by lack of cooling medium:

No alarm information but the motors keep running, cooler can not reach to the setting temperature and working machine’s spindle is hot.

⚠ CAUTION

If the avoid situation occurred, please call us or find the professional technician at local market for repair service.

Coolant system

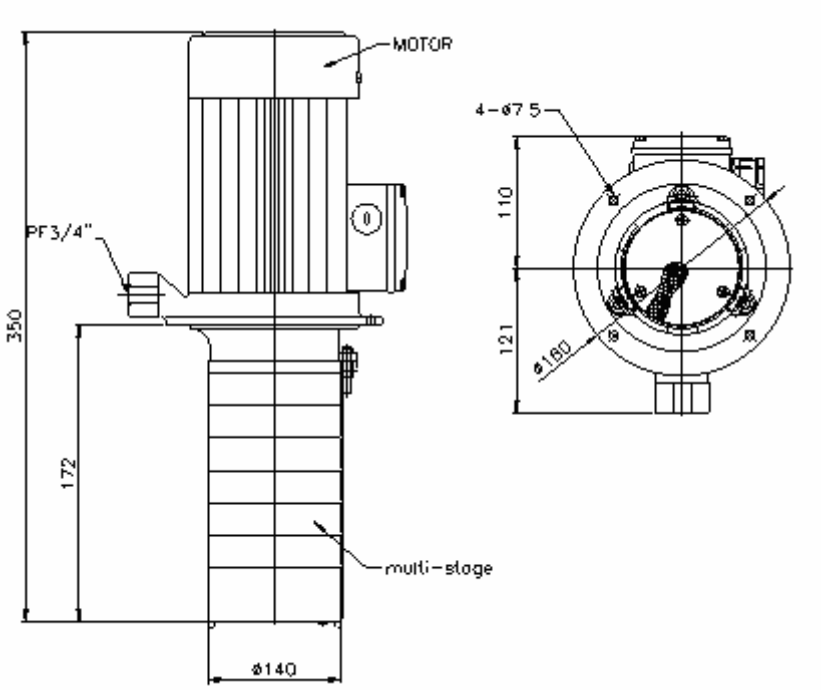
TPHK4T 3-2

The system circulates the coolant with low-pressure pump. It cools the heat when tool is cutting and provides lubricant from coolant's additive for cutting. It also enhances the accuracy of work piece.

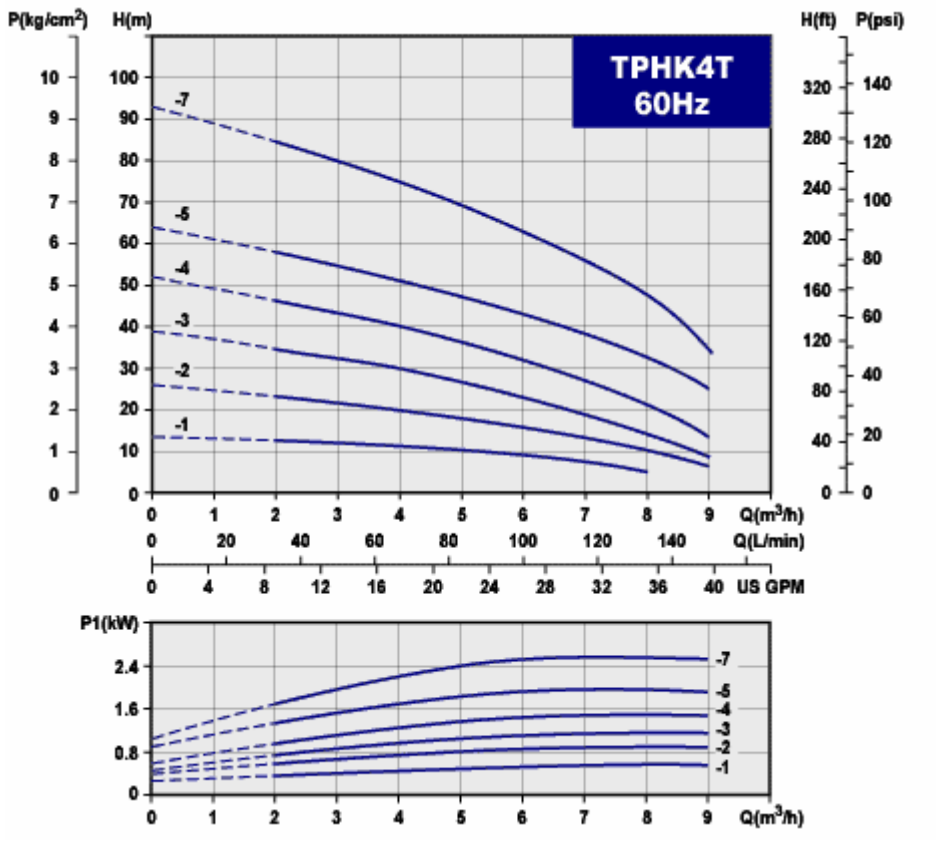
Pump of Coolant B provides flowing water for chip cleaning.

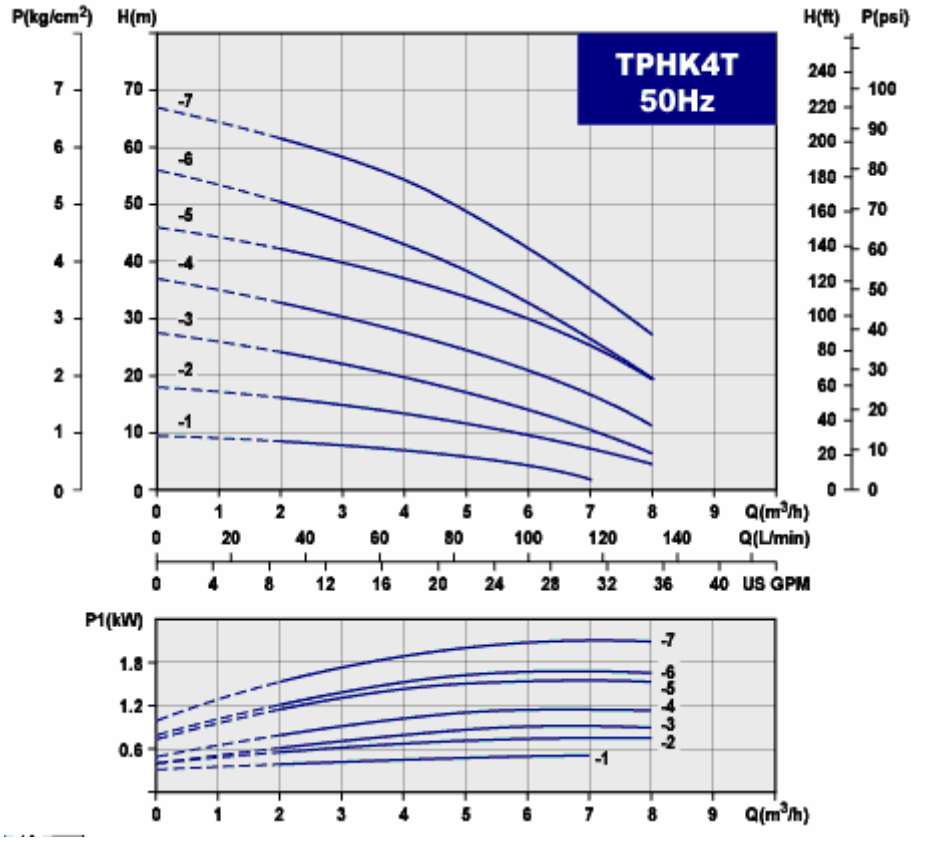
About the Coolant's Additive, please follow the instruction of Additive's supplier to mix the additive with appointed percentage.

Out line



Performance curves


TPHK4T
60Hz
P(kg/cm²)
H(m)
H(ft)
P(psi)
-7
-5
-4
-3
-2
-1
Q(m³/h)
Q(L/min)
US GPM
P1(kW)


TPHK4T
50Hz
P(kg/cm²)
H(m)
H(ft)
P(psi)
-7
-6
-5
-4
-3
-2
-1
Q(m³/h)
Q(L/min)
US GPM
P1(kW)

Pump specification

Item	Unit	Description
Motor		TPHK4T 3-2
Nominal speed	rpm	3500/2900
Frequency range	Hz	60/50
Standard voltages	V	220/380
Protection class		IP54
Insulation class		F
Pump		
Flow rate max.	L/min	185
Head high max.	M	90
Max. pressure	kg/cm²	10

Maintenance

Daily work	5. Clean the chip filter
Weekly work	2. Check the level and re-fill the oil
Monthly work	2. Clean the chips on the chip tank 3. Change the liquids.

NOTE:

- Do nit stare the pump at first time using until it has been filled with coolant.
- Every connection are made as shown on the inside of the terminal box cover.
- The pump should rotate counter 0 clockwise when viewed from the motor end and arrows on the motor fan's cover indicated the correct direction of rotation.
- To reverse the direction of rotation, switch off the power supply and interchange any two of inputting supply wire.

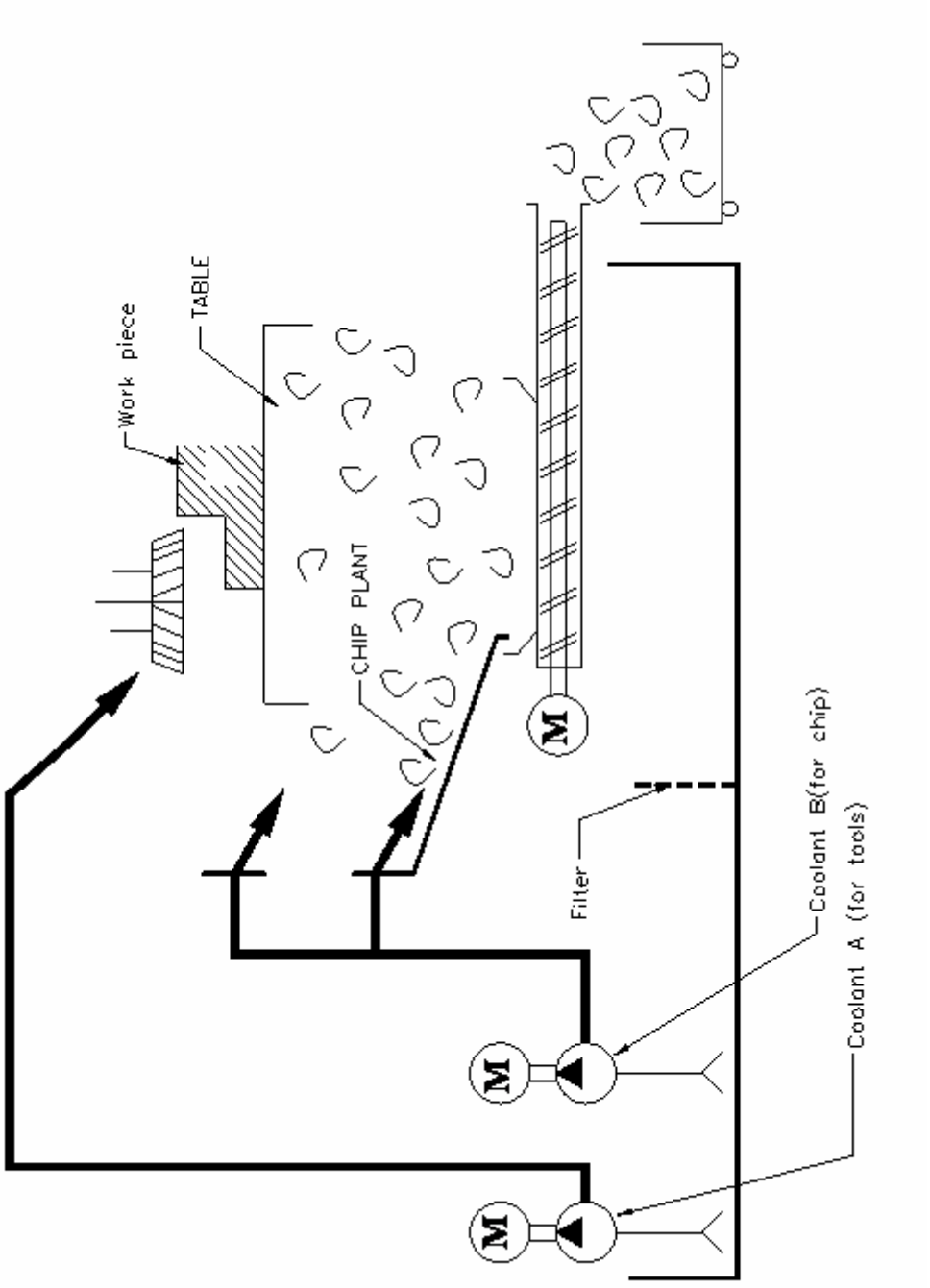
Trouble shooting

FAULT	CAUSE
Pump does not work	Power supply failure. Control circuit has cut out or is defective. Motor is defective or overload. Pump is blocked by impurities.
Pump runs but deliver no coolant	Pump is not filled with coolant in advance. Suction or discharge pipe is blocked by impurities. There is leakage in suction pipe. Foot or check valve is blocked or suction head beyond requirement.
Pump runs but reduced capacity	There is wrong direction of revolution (Three-phrase). Suction head is lifted too great. Suction or discharge pipe is blocked. Pump is blocked by impurities. Foot or check valve is partly blocked.
Pump stops during operating	Thermal overload switch in motor or external motor protection cuts out. Control circuit is failure or cuts out.

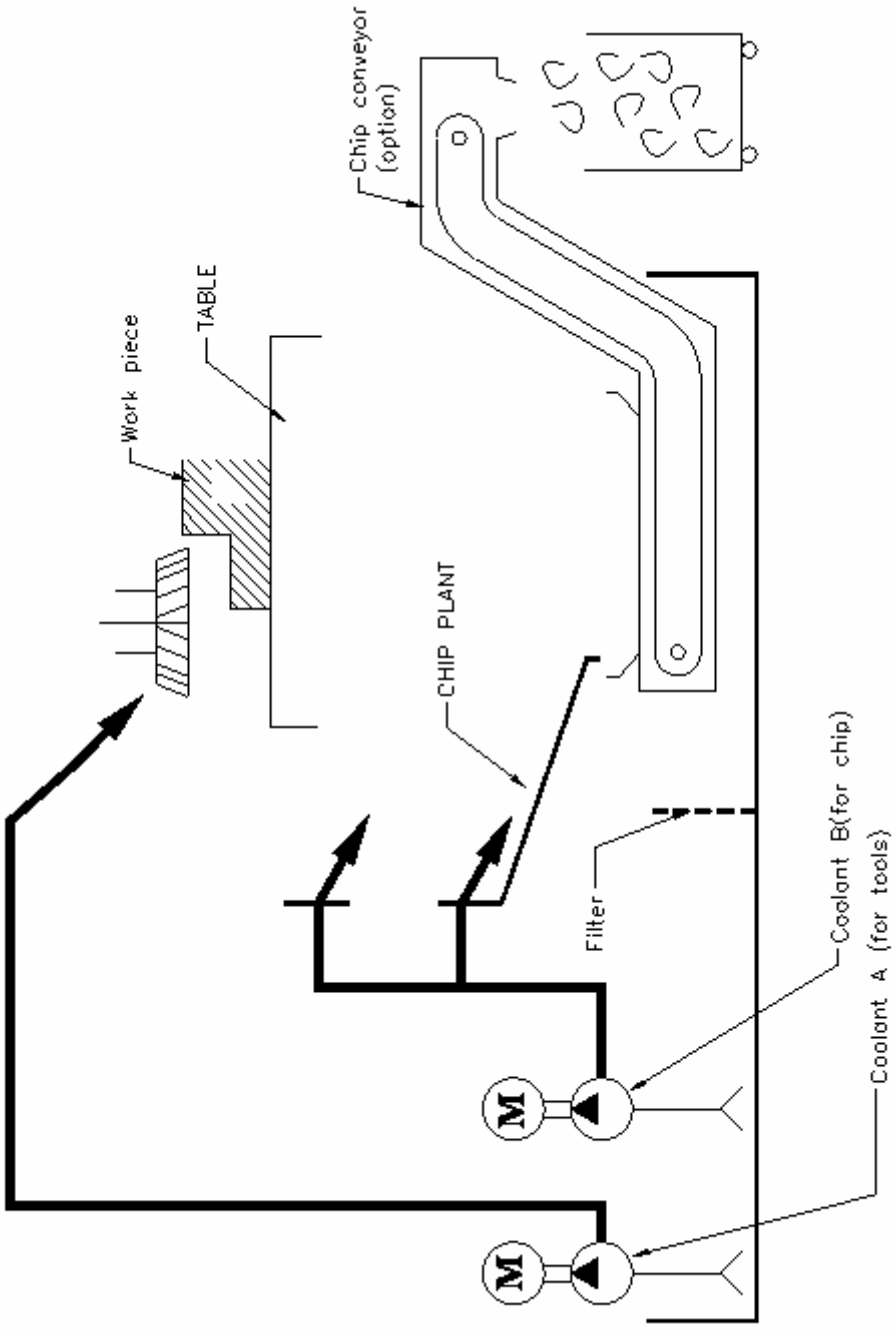
Refer to the drawings following the end of book

The sketch of coolant system

Screw conveyor



Chip conveyor



Transition Coupling

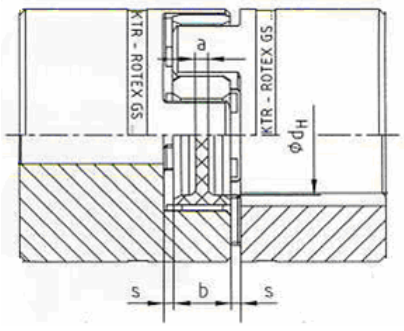
Application

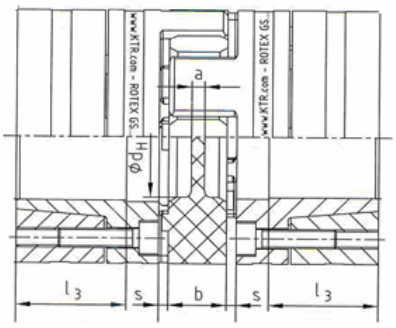
The hub claws and the nylon teeth are chamfered to allow for a “blind assembly”. The ends of the teeth have pegs arranged reciprocally to limit the axial positioning. The plug-in force varies depending on the Shore hardness and priestess of the spider.

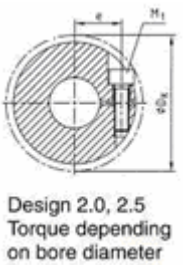
By observing the gap dimension “S” the electrical isolation is ensured, as well as a high service lift of the coupling. This fact is gaining more and more importance, due to the increasing precision of shaft encoders and the existing demand for electro-magnetic compatibility.

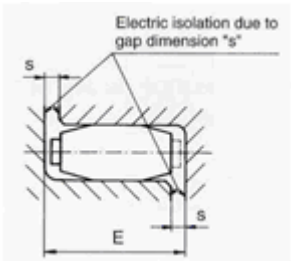
Adjusting Data

ROTEX GS-P TYPE(Hub and clamping ring material-steel) For direct type spindle		
Coupling size	Gap S(mm)	Tightening torque of clamping screw Ta(N/m)
GS42-P	3	35
GS48-P	3.5	69
GS55-P	4	69
ROTEX GS TYPE(Hub material-Aluminum) For ball screw		
GS24-	2	10.5(M6).
GS28-	2.5	25(M8)
GS38-	3.0	25(M8)









Wedges Adjustment

Application

Because the wedges will be abraded after a long time use, the axis with box way will cause chinks. It is a normal situation and it can be solved by wedges adjustment.

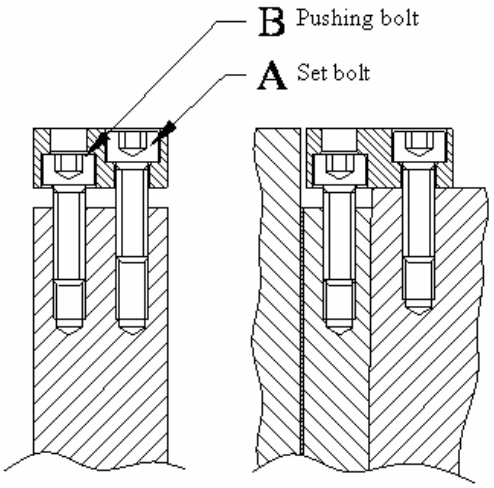
Since the gib adjustment is important to keep a good static accuracy on each axis, it is recommended to contact with our Technical Service before touching to this portion.

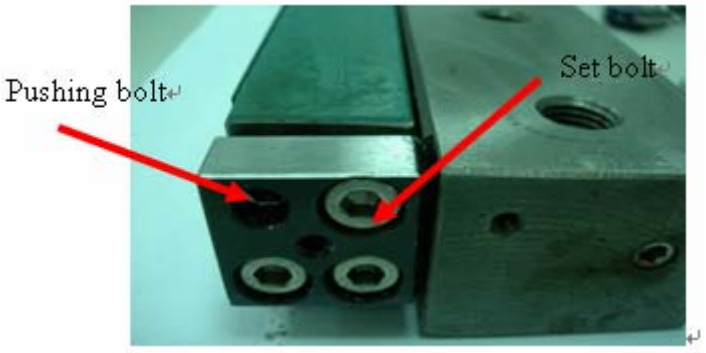
How to adjusting

In order to increase the pre-load, loosen the tension bolt, and then turn the pushing bolt CW for pushing. Apply the torque of 0.9 N-cm(10kgf.cm) to the pushing bolt.

In order to decrease the pre-load, loosen the pushing bolt, and then turn the tension bolt CW.

After setting the proper re-load, make sure that the tension bolt and pushing bolt are locked firmly.





Maintenance

NOTE

- After machine installation.
- Maintain one time after the new machine operates three months.
- Then, maintain the machine six months a time.

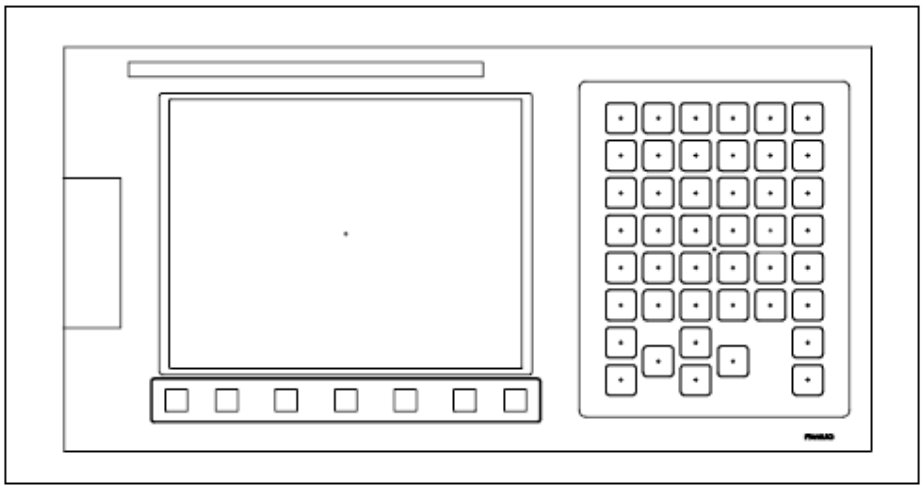
4-OPERRATION MANUAL

(Fanuc 0iMD)

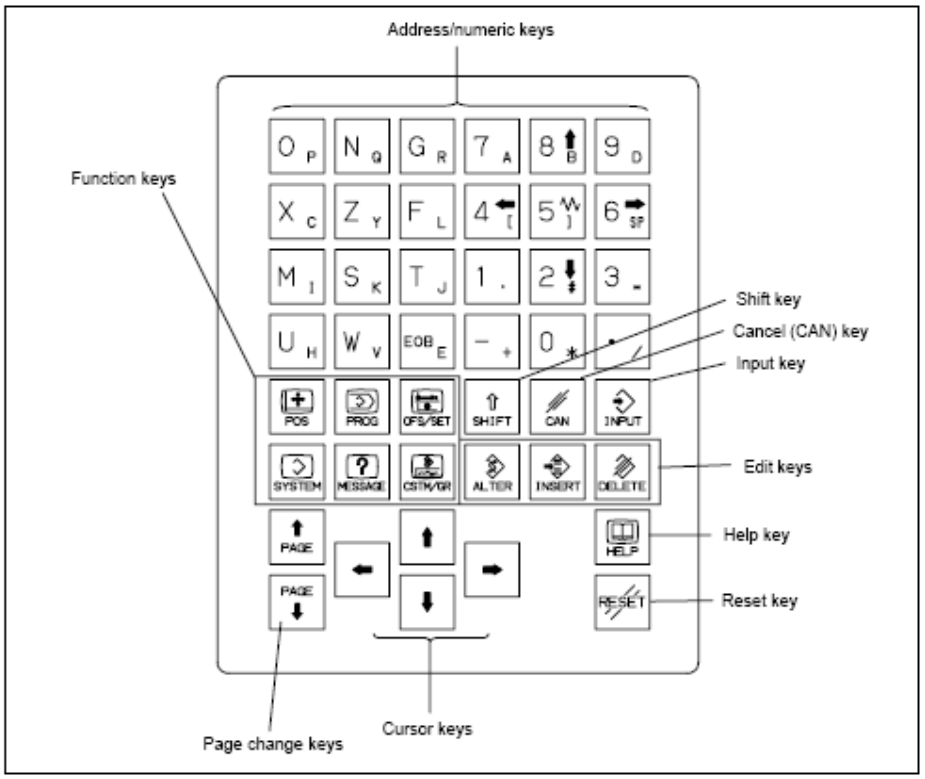
TABLE OF CONTENT

Fanuc 0iMD Control

Control panel layout
8.4” TFT/MDI

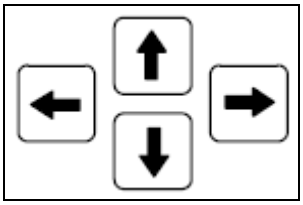


MDI unit

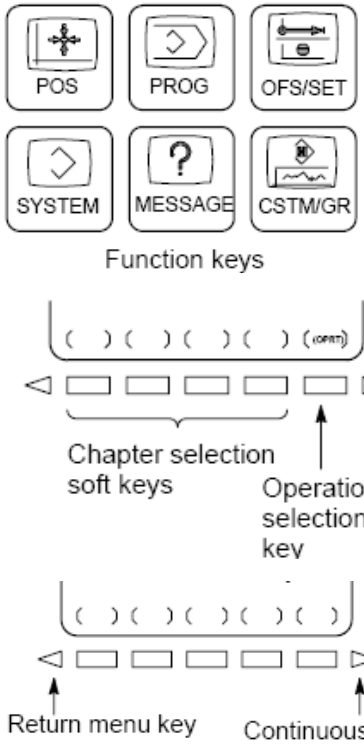


Explanation of the keyboard

Reset key 	Used to reset the CNC to release an alarm or other similar state.
Help key 	Press this key to display how to operate the machine tool, such as MDI key operation, or the details of an alarm which occurred in the CNC (Help function)
Soft keys	The soft keys have various functions, according to the Applications. The soft key functions are displayed at the bottom of the screen.
Address/numeric keys  	Press these keys to input alphabetic, numeric, and other characters
Shift key 	Some keys have two characters on their key top. Pressing the <SHIFT> key switches the characters. Special character ∧_ is displayed on the screen when a character indicated at the bottom right corner on the key top can be entered.
Input key 	When an address or a numerical key is pressed, the data is input to the buffer, and it is displayed on the screen. To copy the data in the key input buffer to the offset register, etc., press the <INPUT> key. This key is equivalent to the [INPUT] key of the soft keys, and either can be pressed to produce the same result.
Cancel key 	Used to delete letters or numbers input to the key input buffer. Example) When N001X100Z is displayed on the key input buffer, pressing the cancel key deletes the letter Z, and N001X100 is displayed.

Edit keys 	Used to edit programs.  : Alter :  : Insert:  : Delete:
Cursor keys 	Four cursor key are provided  : Moves the cursor to the right or forwards in small units.  : Moves the cursor to left or backwards in small units.  : Moves the cursor downward or forwards in large units.  : Moves the cursor upward or backwards in large units.
Page-up/down keys 	Page-up and page-down keys are provided.  : Used to display the next page.  : Used to display the previous page.
Function keys 	Press theses keys to switch display screens for each function.

Explanation of the Function Keys

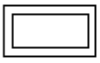
General Screen Operations 	Function keys are provided to select the type of screen to be displayed. The following function keys are provided on the MDI panel  : Press this key to display the **position screen**.  : Press this key to display the **program screen**  : Press this key to display the **offset/setting screen**  : Press this key to display the **system screen**  : Press this key to display the **message screen**  : Press this key to display the **custom screen (conversational macro screen) and graphics screen**

Explanation of soft keys

To display a more detailed screen, press a function key followed by a soft key. Soft keys are also used for actual operations.

The following illustrates how soft key displays are changed by pressing each function key

The symbols in the following figures mean as shown below :

 : Indicates screens

: Indicates a screen that can be displayed by pressing a function key(*1)

[ ] : Indicates a green–lettered soft key.(*2)

( ) : Indicates input from the MDI panel.

[ ] : Indicates a black–lettered soft key.

 : Indicates the continuous menu key (rightmost soft key).

Built-in function key

How to show the screen

Select the built-in function key procedure

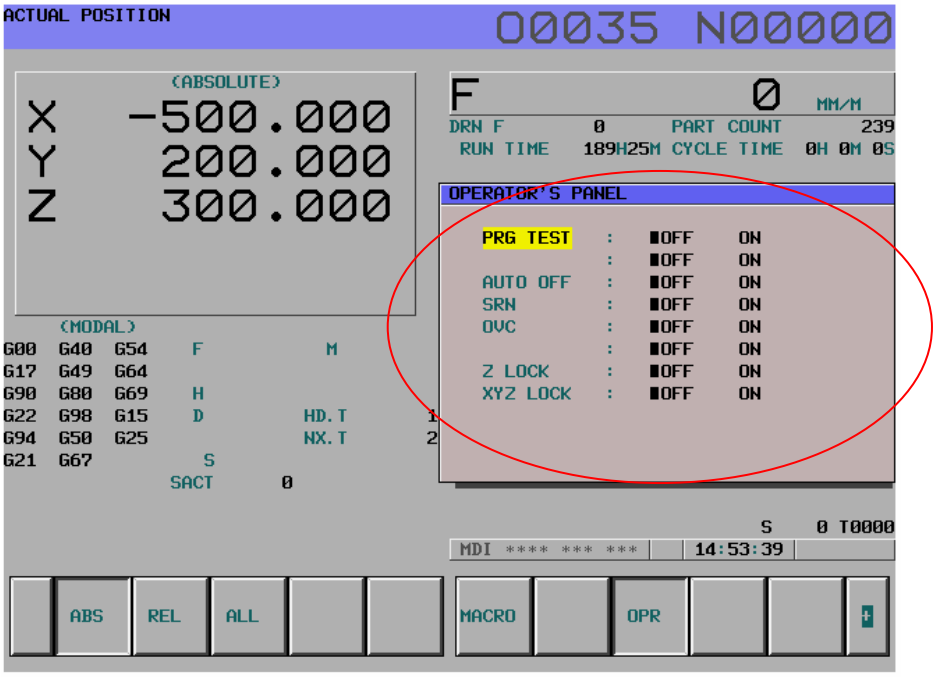
Press [MDI] mode

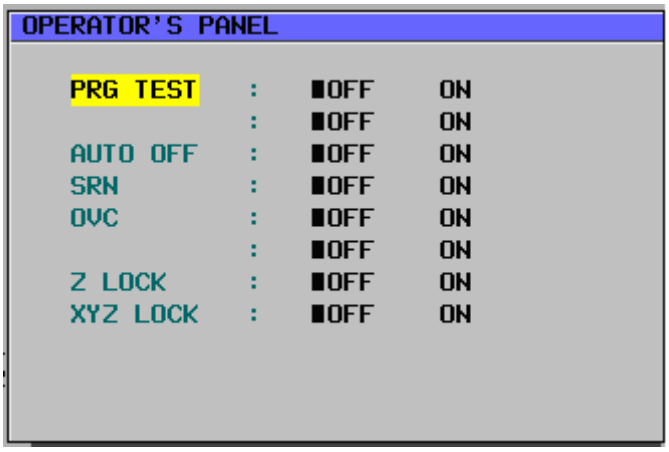
Press [OFFSET SETTING] key on the MDI panel

Press [+] key until [OPR] soft key appearing.

Press [PAGE ↓] key on the MDI panel.

It will appear Operating Screen.





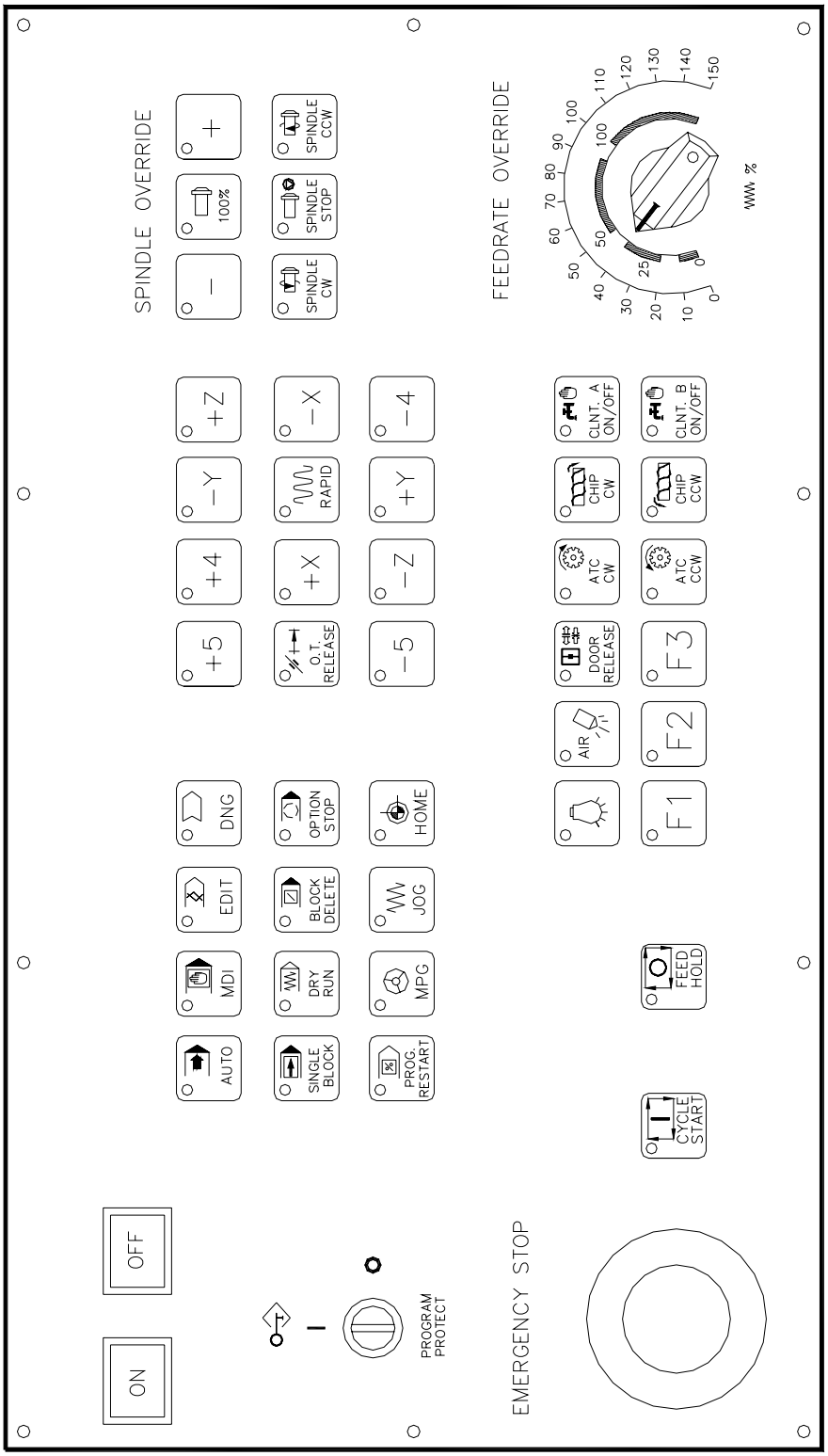
Function description

[PRG TEST]	This function is “ON” the program test is able to execute.
[AUTO OFF]	This function is ON the POWER OFF function is able to execute.
[SRN]	This function is “ON” the [PRO.REST] function is able to execute. Press the [PRO.REST] button the LED will be lit.
[OVC]	This function is “ON” the federate override control on program command. Federate override switch on operation panel is unable.
[Z LOCK]	If this function is on, Z axis will not move when the machine executes the program. But the other axis will still move.
[XYZ LOCK]	If this function is on, X/Y/Z axis will not move when machine executes the program. But spindle will be rotating.

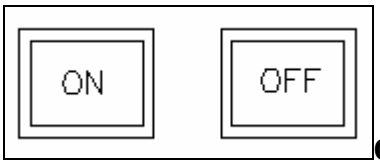
Machine panel (option 2)

which are the bunch of functional and selective buttons for operator during machining

Panel layout

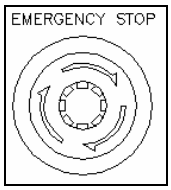


Panel description



ON/OFF switch

Monitor power on and off, ON will display green light as well as OFF will be red light while button be pressed



EMERGENCY STOP

When the [EMERGENCY STOP] switch is pressed machine movement stops in a moment and the operating-area door shell be released.

This button is locked when it is pressed, and can be unlocked by twisting it.

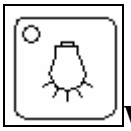
CNC will display EMG STOP massage on the screen.

If drives are switched off, the consequence may be contour damage or tool breakage.

DOOR RELEASE

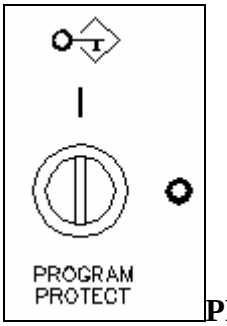
This button made to release the door interlock of CE type only for the safety sake.

Normal situation the door is closed.


Working light

Press this button one time, the working lamp will light on and press it again the lamp will extinguish.

The button made for bringing light during machining by pressing the button one time to turn on the light. Twice pressing will extinguish.



PROGRAM PROTECT

The key switch uses for protecting NC's program. When the key turned to "I" position, operator can edit program or it will be locked up on can not edit program on "O" position.

CYCLE START

Start automatic operation or cycle command

FEED HOLD

Temporarily stop feeding in automatic operation started by the CYCLE START button.

AUTO mode

This mode is selected to execute the program automatically

MDI mode

The mode used for inputting data, modifying parameters and executing by manual.

EDIT mode

This mode is selected to edit registered program.

DNC mode

The mode used to execute the program from external computer transmitted

HOME mode

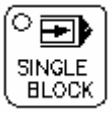
The mode selected axis to return to the reference original position or with CYCLE START button to return to home position for three axes at the same time.

JOG mode

The mode is used to move three axes by jog trot or rapid speed.

MPG mode

The mode selected to move axes manually with the direction of axes and speed on the handle wheel.



SINGLE BLOCK

Under AUTO, MDI and DNC mode, as soon as the button is pressed will stop the machine after executing one block of program.

DRY RUN

If this button is pressed during the cycle operation of DNC, MDI or AUTO mode, the command specified on NC memory will be ignored and the feed rate will be at jog speed (G01) or controlled speed by turning the knob of FEEDRATE OVERRIDE.

BLOCK DELETE

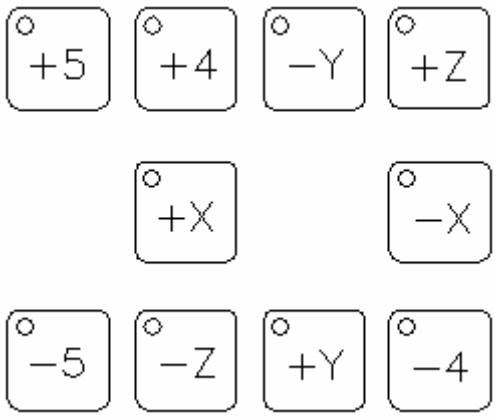
The button for deleting the command of single block which is added the "/" mark before the block command.

OPTION STOP

This button made to stop block commands with M01 code under DNC, MDI or AUTO mode. Press "CYCLE START" can execute the program continuously.

PROGRAM RESTART

The button made for restarting the program command which was interrupted. The function of this button is not available for Meldas control.



Axis select switch

The either one of axes movement and the direction buttons while they are pressed each axis home direction can return to home position only individually under HOME mode.

Over travel release

The button made to release each one of the axes, which are over traverse and eliminate the alarm message.

RAPID switch

The button made for rapid moving axes by pressing this button and moving axis together with the knob of FEEDRATE OVERRIDE to control the speed of movement.

Air blow for cutting

The air blast button made for air supply during machining by press the button one time will be on and twice will be off.
On the other hand, during executed program through M47/M48 can be done.

F1 prepare key

This button is for M30 automatic power off function
When key ON the auto power off function is available

F2 prepare key

The button made for spare function not available now.
ON double column machine this function for air blow by menu

F3 prepare key

The button made for spare function not available now.

Tool disk rotating

Under the manual mode, press the buttons for turning the tool magazine with CW or CCW direction.

Chip conveyor

The buttons are pressed for turning the coil type chip conveyor with CW or CCW direction.

Coolant ON/OFF

The buttons made for supplying coolant A type (beneath the spindle) or coolant B type (beneath the enclosure guard).

Coolant A type can use commands of M08/M09 to turn on and turn off.

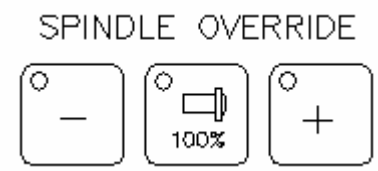
Spindle CW

The button pressed after the spindle speed command has input under MDI or AUTO mode, it will turned with CW direction under manual mode.

Under the manual mode, press this button, then the spindle will stop turning right away.

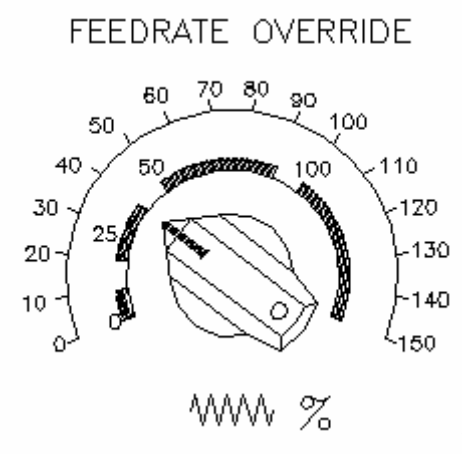
Spindle CCW

The button pressed after the spindle speed command has input under MDI or AUTO mode, it will turned with CCW direction under manual mode.



Spindle override

Press the "+" or "-" button can change the spindle speed within 50% to 120%. Press the "100%" button then machine will restore the original speed.



Federate override

The knob use to select the feed rate during cutting by decremented or incremental troll feed and avoid the crashing happened.

Rapid override

The knob selected to deliver the feed rate of rapid traverse for three axes.

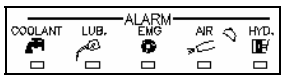
For choosing rapid feed rate within the range of 0%, 25%, 50% and 100%.

0%=Max. rapid speed is 0.5 M/min

25%=Max. rapid speed * 25%

50%=Max. rapid speed * 50%

100%= Max. rapid speed * 100%



Alarm massage lamp

Coolant Alarm: The warning lamp will light on while there is something wrong with coolant delivery and the screen will show the alarm message.

Lubricant Alarm: The warning lamp will light on while there is something wrong with the lubrication system's delivery and the screen will show the alarm message.

Emergency Alarm: The warning lamp will light on while there is emergency situation happened during machining and the screen will display the alarm message.

Pneumatic Alarm: The warning lamp will light on while the pneumatic system's delivery in trouble and the screen will display the alarm message.

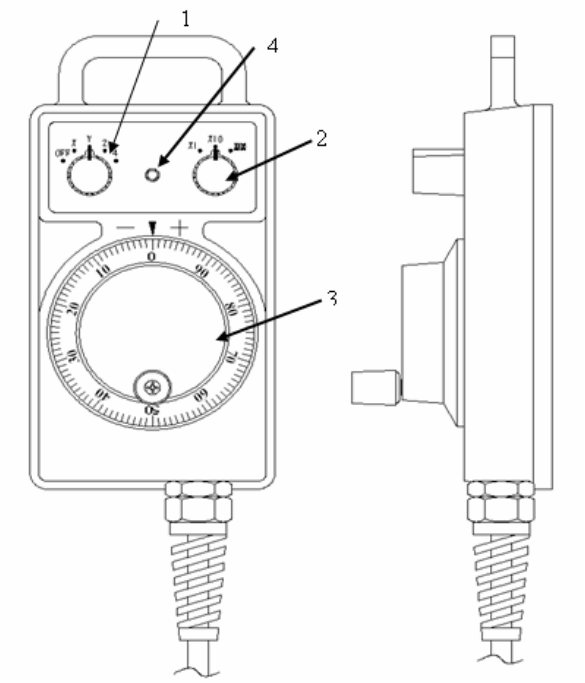
Hydraulic Alarm: The warning lamp will light on while the hydraulic system's delivery in trouble and the screen will display the alarm message.

MPG indicate

Manual pulse generator

This M.P.G box is use for charging the feed in manual operation mode. This handles only use for selection of axis direction and federates which is for each pulse on X/Y/Z/ 4 must be selected with manual mode switch or axes direction button.

Layout



MPG operation

1	Axes selection knob	Select certain axis which is operated by operator.
2	Movement selection knob	Select the proper movement of axis with in 0.001, 0.01 or 0.1 mm.
3	MPG Lever	Turn the lever to move certain axis.
4	Indicated lamp	Indicated lamp light on for showing normal use

UNIT	X1	X10	X100
Metric	0.001	0.01	0.1
Inch	0.0001	0.001	0.01

1. Select [MPG] Mode
2. Select one axis by X,Y,Z or 4 axis selection knob
3. Select desired increment of travel by using X1, X10, X100 selection knob.
4. Rotate manual pulse generator (MPG) clock-wise or counter clock-wise for plus or minus motion, respectively. For each detent or "click" of MPG handle, one selected. Increment or travel will be commanded. Direction lamp will be lit during motion.

Power ON/OFF

Power on

Before switch-on/actuation of machine make sure that nobody can be in danger by running up the machine.

Danger of accidents!

Do not touches open components in control cubicle, they may be under voltage

⚠ WARNING

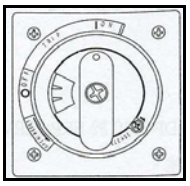
- The machine must be used by authorized personnel only!
- Please do not touch any switch or button when your hands are wet.
- Make sure the surroundings near the machine is clean without any obstacles before you power on the machine.

NOTE

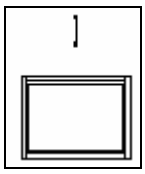
- Please check if there is enough oil, water and air pressure supply.
- If there is any work piece or fixture, after power on the machine, please operate spindle under manual mode to a proper location. Then move back to mechanical HOME action.
- Must warm up with low speed more than 15 minutes after power on the machine.

Power ON procedure

1. Turn on the air pressure supply.
2. Turn the main switch on the cabinet to "I" or "ON" position.
   Voltage supply of control and measuring systems.



3. Press [POWER ON] button on operation panel

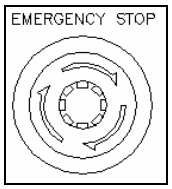


⚠ WARNING

Close operating area doors

Doors locks automatically (CE serious)

4. Release [EMERGENCY STOP] button on operation panel



5. When the power on work is finish the “NC READY” lamp shell is lit.

6. Press [RESET] key on the MDI panel to finished power ON.

7. Set MODE in [HANDLE].
8. Remove all axes more than 200 mm to the center.
9. Set MODE in [HOME).
10. Adjust feed rate button to 25%.
11. Press [HOME] of Z、Y、X、4 axes.

Machine can start normal operation after all axes return HOME.

Power OFF

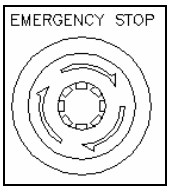
NOTE

Please lock the electric cabinet after power off to avoid danger by powering on the machine accidentally.

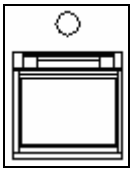
Please do not leave the keys on the door lock or the switch after power off.

Power OFF procedure

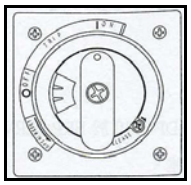
1. Set MODE in [HOME].
2. Set feed rate to 25%.
3. Press [HOME] of Z、Y、X、4 axes.
4. Remove all axes to center.
5. Press [EMERGENCY STOP] button on operation panel.



6. Press [POWER OFF] button on operation panel



7. Turn the [MAIN SWITCH] on the cabinet to “O” or “OFF” position.



8. Turn off the air pressure supply.

If the machine and control were disconnected from power (power switch OFF), after switch on, the reference points of all active axis must be approached. Otherwise, the drives shall be locked and the axis slides may be moved in manual operation only.

Re-start

Eliminate cause for ENERGENCY STOP.

Release interlocking of [ENERGENCY STOP].

Press [RESET] key on the MDI panel.

Restart interrupted machining.

Handling Procedures of Power Interruption

If the power is interrupted when machine is operating, the machine and controller will stop immediately. The list below shows the states that before/after power interruption:

	Before Power Interruption	After Power Interruption
Spindle Clamp/Unclamp	Clamp/Unclamp	Clamp
Spindle rotation	Rotating	Stop
Movement of each axis	Moving	Stop
Z axis Brake	Open	Close
ATC rotate to choose tool	Rotating	Stop
Power Supply	Power on	Power off
Controller Power Supply	Power on	Power off

Handling Procedures after Power Interruption：

1. Turn off the main power.
2. Press EMG button which is on the operational panel.
3. If the cutting quality of work piece was effect by interruption, please replace the work piece and tool.

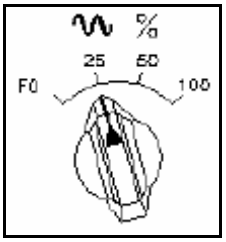
After the power resort again, please follow the power-on procedure. Set the cutting conditions just like it before power interruption, then continue to cut.

Reference original position

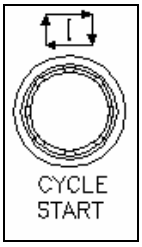
Operation procedure

Press the [HOME] mode selection switch.

2. Set the [RAPID OVERRIDE] speed to F0%, 25%, 50%, or 100%.
   Carefully set the required feed by potentiometer rapid override



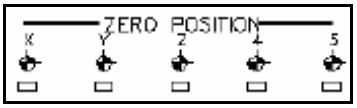
3. Press [CYCLE START] button on operation panel.



First the Z axis then the X, Y axis and then all other axes are move at traverse rate to home position.

When each axis has completed finding the reference position the related machine coordinate will become to zero.

If the reference point is approached, this symbol lamp shall be lit.



Pressing the [POS] key on the MDI panel will switch to different position display which includes machine coordinate, absolute coordinate and related coordinate.

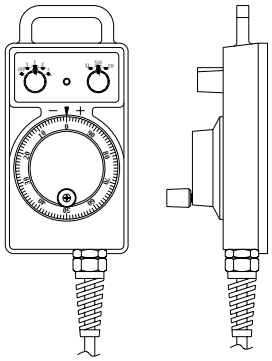
4. Press the [RESET] keys on the MDI panel to exit.

MPG operation

In the [MPG] mode, the axis moment can be minutely moved by rotating the MANUAL PULSE GENERATOR (MPG) on the separated operator box. Select the axis along which the axis is to be moved with the handle feed axis selection switches.

The minimum distance the tool is moved when the manual pulse generator is rotated by one graduation is equal to the least input increment.

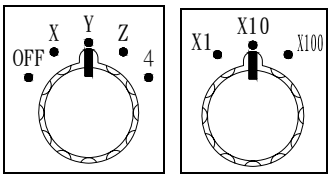
Or the distance the tool is moved when the manual pulse generator is rotated by one graduation can be magnified by 10 times or by one of the two magnifications specified by parameters (No. 7113 and 7114)



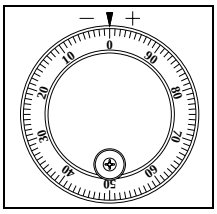
Operation procedure for MPG

Select [MPG] mode on the operator's panel.

Select the axis and feed rate speed select switch.



Move the selected axis by rotating the handle. Rotating the handle 360 degrees moves the axis the distance equivalent to 100 graduations

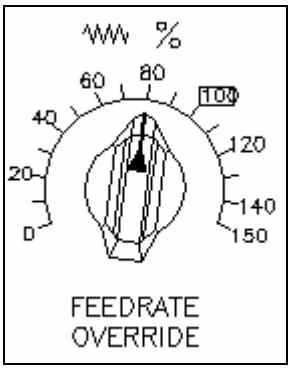


JOG/RAPID operation

Procedure for JOG feed

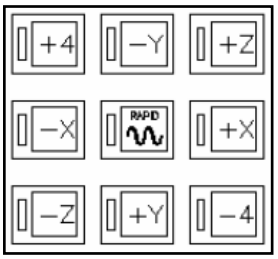
1. Press the [JOG] switch into JOG mode.

2. Adjusting the [FEEDRATE OVERRIDE] switch.



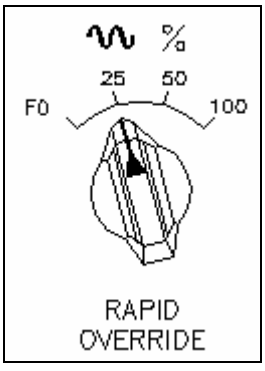
[FEEDRATE OVERRIDE]

3. Press the feed axis and direction selection switch corresponding to the axis and direction the tool is to be moved. While the switch is pressed.
   The axis moves at the feed rate specified in a parameter (No. 1423)



4. In the same time the 

switch is pressed the feed rate speed depend on [RAPID OVERRIDE] selection.



The travel moving stops when the switch is released.

Spindle to reference point

Select [MDI] mode on the operator's panel.

Press [PROG] key on the MDI panel.

Input the commend below next step

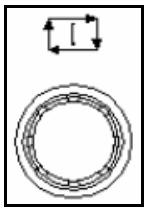
[M19]

[EBO]

[INSERT]

Press [CYCLE START] on the operator's panel.

key in commend



The spindle rotating and stop at reference point.

Spindle rotating by manual

Select [MDI] mode on the operator's panel.

Press [PROG] key on the MDI panel.

Input the commend

- For example

  - [M3 S1000]
  - [EBO]
  - [INSERT]
  - Press [CYCLE START] on the operator's panel the spindle rotating in the moment.
  - When the [RESET] key on the MDI panel is pressed the spindle stop at the moment.

S command: spindle rotation speed command

The spindle speed can be specified directly by address S followed by maximum five digit value. The unit is rotation per minute (rpm).

The S command must be specified with M3/M4 command in the same block to run the spindle. Using M5 command or pressing [reset] can stop the spindle

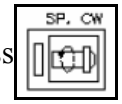
Example: S 10000; spindle rotation speed is 10000rpm.

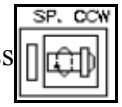
M3 S2000 mean is spindle CW, 2000 rpm

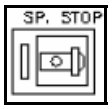
M4 S3000 mean is spindle CCW, 3000rpm

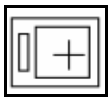
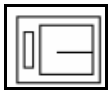
M5 mean is spindle stop.

Follow the last S commend input then you can rotate spindle easy way following next step.

- In [MPG] or [JOG] mode
- Press 

key on the operator panel the spindle clockwise by 1000 rpm speed..
- Press 

key on the operator panel the spindle counter clockwise by 1000 rpm speed..
- When 

key is pressed the spindle stop in the moment.
- The  button every press will increase 10% speed of Sxxx value. Four step to increase speed.
- The  button every press will decrease 10% speed of Sxxx value. Four step to decrease speed.
- When the button is pressed the spindle execute 100% speed according to the value of Sxxxx.

Tool loading/unloading

When the spindle is rotating, please keep a distance from the spindle.
Before loading the tool, please collocate the tool, fix the pull star and clean the taper & holder.
When spindle is loading/unloading the tool, please match with "Tool No. Change Operation".
Please double check after spindle loading tool.

Execute tool loading

Execute tool loading between spindle and correct position of tool magazine.
To complete this procedure follow the next procedure:
After the tool loading on spindle by manually.

- Select into [MDI] mode
- Key in commend for which tool number going to load

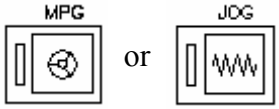
For example :
[M6 T10] [EBO] [INSERT]

Press [CYCLE START] button on operator's panel to execute.

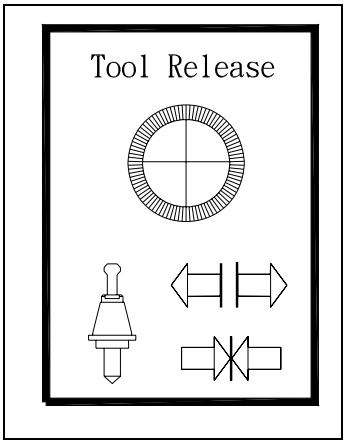
Unloading tool

Unloading tool out of spindle procedure:

- Press [MPG] or [JOG] push button on the operator panel.



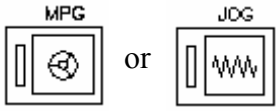
- Press [TOOL RELEASE] button until the draw bar open and tool is completely out of spindle.
- Take off tool and release [TOOL RELEASE] button the draw bar clamping immediately.



Loading tool

Loading tool into spindle procedure:

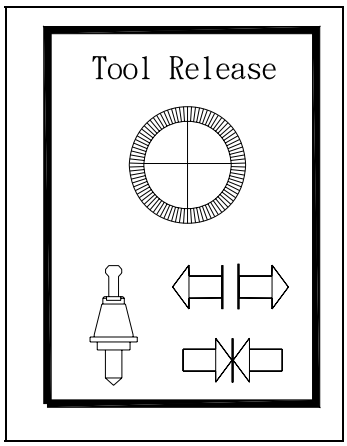
- In [MPG] or [JOG] mode:



- Press [TOOL RELEASE] button until the draw bar open. (more than one second.)
- Place the holder into the spindle.

  NOTE!

  The keys on the nose of the spindle must fit into the key-ways in the holder flange.
- Release the [TOOL RELEASE] button to lock the tool into the spindle.



NOTE!

The tool holder must be held in the left hand with the thumb and the first finger grasping the holder below V groove. No other fingers should have contact with the holder or the tool in the holder. The area below the V groove is called the safe zone. The safe zone is the only place where the tool holder should be held.

Door interlock operation

(CE specification–option)

- When the operation door is opened, the actions below are forbidden:
- Press [CYCLE START] to execute the program.
- X、Y、Z axis movement (low speed、high speed、return HOME mode)。
- Spray cutting oil manually (except with spray gun)。
-

NOTE

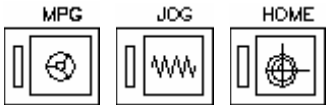
- The actions above will cause alarm.

- Under the terms below, it is invalid to press the open button of operation door：
- During the execution of the program.
- During the operation of spindle (clockwise、counterclockwise、positioning、gear shifting)
- During the movement of X、Y、Z axis (feed rate、low speed、high speed return HOME mode)
- During the operation of chip conveyor (clockwise、counterclockwise)
- During the spray of the cutting oil.

NOTE

- When the operation door was forced to be opened without pressing the open button of the operation door, the machine will enter emergency stop status.
- When the operation door is open, the maximum spindle speed can not be more than 50 rpm and feed rate can not be more than 2M/min.
- When the program execution finished or any alarm message cause the machine to stop. When the alarm lit with red light, the door interlock will turn to [release] status automatically.

How to release door interlock

- Under [HANDLE] mode
- 

- Select [DDOOR RELEASE] key
- 

- Door interlock will release automatically

Coolant System Operation

Coolant A Operation

Manual Operation

Press the 

on the operational panel, the light will be on. The tubes beside of the spindle will spray the coolant. Please also open the Cock at the other side of spindle. Press the 

again, the light will be off. The coolant will stop spraying.

Automatic Operation

In cutting program, M code can control whether Coolant spray or not.

M08：Coolant starts to spray.

M09：Coolant stops spraying.

But this function is also controlled by 

key. It means that you need to press this button and the coolant will spray out.

Coolant B Operation

Manual Operation

Press the 

key on the operational panel. When the light is on, coolant will spray out from the side of Base. Press the 

key again, the light will be off. Coolant will stop spraying.

* When using the 

key, please note that coolant gun can work.

Automatic Operation

In cutting program, M code can control whether Coolant spray or not.

M08：Coolant starts to spray.

M09：Coolant stops spraying.

But this function is also controlled by 

key. It means that you need to press this button and the coolant will spray out.

Coolant Gun Operation

Before using the coolant gun, please close the Cock beside the spindle. Press

key on the operational panel, the light will be on. Then, you can use the coolant gun. Press the 

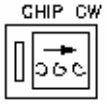
key again, the light will be off. Coolant will stop spraying.

* When using M08, please note that coolant gun can work.

Chip conveyor operation

Manual operation

Press 

on operation panel. When the light is on, the chip conveyor will send out the metal chips. When you press 

again the chip conveyor will stop.

Troubleshooting

Troubleshooting : When the chip conveyor is stuck：

1. Please remove the extra chips with tools manually.
2. Observe how the chip conveyor got stuck.
3. Press 

key, and check if it is moving? If it can move backward, then remove the chips and move forward.

4. If it can neither move backward nor forward. Then the motor may be burned out or the chips are fully stuck in. Please kindly contact your dealer.

: **NOTE**

Never remove chips with hands to avoid cutting by the chips.

Normal stop cycle

There are some ways to stop the machine during operation.

Program stop (M00)

After the single block of the program includes M00 operation, stop the AUTO operation. All the production terms remain the same.

Selective stop(M01)

Similar to M00, including after M01 single block operation, then stop operation. This code is only valid when [OP STOP] on the software operation panel is ON.

- ON：Set the software operation panel [OP STOP] to ON。
  - Under [AUTO] or [MDI] mode, when you execute M01 code, it will stop automatically. You must press [CYCLE START] so it will continue to execute program.
- OFF：Set software operation panel to OFF.
  - Under [AUTO] or [MDI] mode, when you execute M01 code, it will not stop automatically. It will continue to execute the program.
- Program end .[M02，M30]

Enter M02 or M30 at the last single block of the program to indicate the program ends. When the program executes the last single block, the machine will stop all operation and the program execution light will be on. If the last single block is M30 or M02, the cursor on the screen will return the beginning of the program. It means the status to start from the beginning and the program end light blinks.

Single block stop

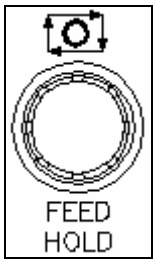
The function is to make the machine stop after executing program single block.

- ON：Press the button and the inner light of the button will be on.
  Under [AUTO] or [MDI], when you execute auto-production program, press [CYCLE START] and only execute one single block. If you would like to execute the next single block, you must press [CYCLE START] again.
- OFF：The inner light of the button is off when you did not press any button.

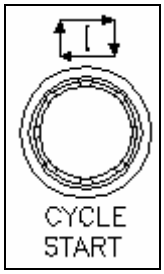
1. When you execute G28 and G30, the single block function will stop at the middle point.
2. Under the routine cycle single block stop point shows the end of “←”, “↑”, and “±”. When you click “←” or “↑” single block function and it is valid, the feed rate light will be on.

3. Single block stop includesM98P____；M99；and the single block of G65 does not execute. However, if the single block includes the address except O，N or P, even when it is on M98P____ or M99 the command single block will stop.
4. Under AUTO execution, when you suddenly switch to [EDIT] or [MDI], then NC will enter single block status automatically.

4. Execute [CYCLE STOP]

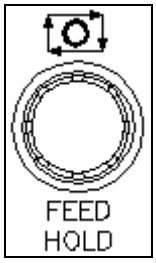


Press [CYCLE STOP] during the execution of the program, and all actions stop. (including: feed, spindle, and cutting water)

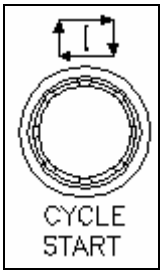


Press [CYCLE START], and spindle returns to the original speed. Then feed will recover. Original cutting water function and chip conveyor operation will recover.

5.[FEED HOLD]

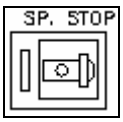


Under [AUTO] or [MDI] mode to execute the cutting program, when you press [FEED HOLD], the axes feed will stop, but spindle and cutting water remains operation.
When you press [FEED HOLD], the [FEED HOLD] light will be on, and [CYCLE START] light will be off.
↑ When you execute G04, it will stop the function of pause.
→M, S, T, and B motion execute to the end of single block and stop.
註 1：If you switch to [MANUAL] mode during program execution, NC will enter [FEED HOLD] automatically.
註 2：When NC shows PLC alarm during the program execution, NC will enter [FEED HOLD] automatically.



If you would like to continue, please press [CYCLE START].

6. Spindle stop



When spindle is running under [AUTO] or [MDI] mode, if you only want to stop the spindle except the program. Please press [FEED HOLD] and three axes will stop. At this time, press [SPINDLE STOP], the inner light of [SPINDLE STOP] will be on. If you would like to continue program execution, press [CYCLE START]. Then spindle will run first and then axes will continue moving.

Under [MANUAL] mode, when you press [SPINDLE STOP], the spindle will stop and the light will be on.

7.Reset

[reset] The reset button on CRT/MDI panel or emergency switch can cancel the auto-operation status and make the system enter the reset status.

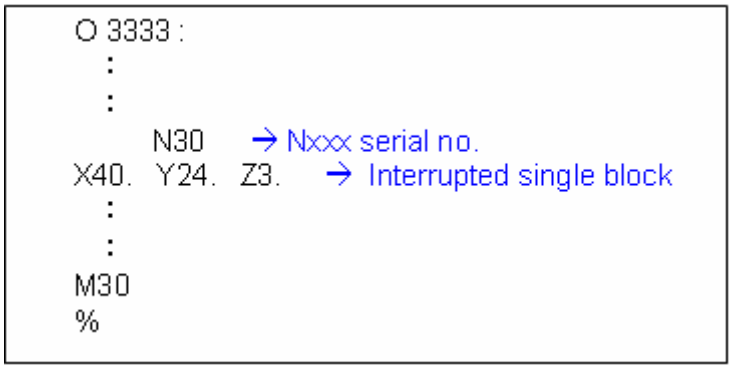
Program restart function

For Fanuc 18iMB/0iMD PA

When cutting tool is damaged or other reasons make the cutting program stop, this function can restart the program from the single block which is interrupted.

By NC Memory

Ex:



1. If tool is damaged when machine is executing the cutting program, please press **FEED/HOLD** button immediately and record the coordinates of interrupted position. (If the program has edited N serial no., please record the N no. of interrupted position.)

2. Press **RESET** button. → Move Z axis by hand wheel. → Move tool upward. → Tool will leave work piece.

3. After replacing a new tool, please re-collation tool length and renew tool compensation value.

4. Input G40, G49 and G80 (Cancel commands) in **MDI** mode, then press **CYCLE/START** button to execute it.

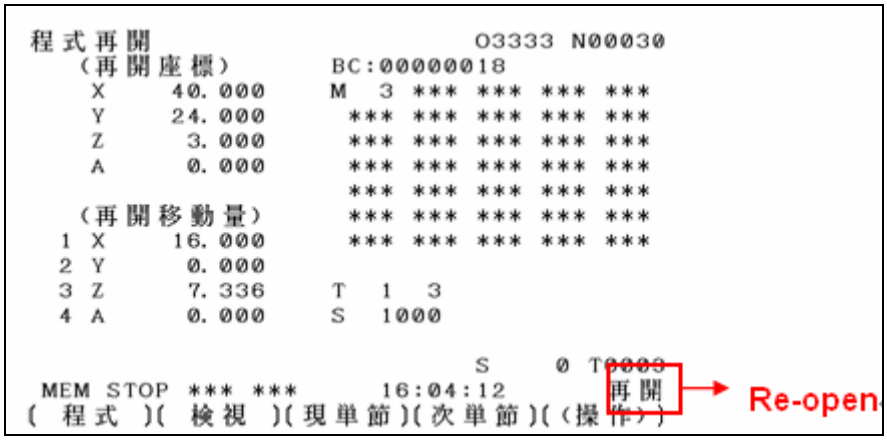
5. In **EDIT** mode, add serial no.─ Nxxxx in front of the interrupted single block. Press **RESET** button and program will back to the start. (If program has edited Nxxx serial no. before, use the Nxxxx serial no. directly. It's doesn't have to modify Nxxx serial no.)

6. Press **PRO/REST** button and **SG./BLK.** button which are on the Operational Panel.

7. In **AUTO** mode, press **PROG** button. Input serial no.: **30** of interrupted single block. (Not include "N".)

8. Press → button (Next page) which is at the lower right side of monitor. Press soft key [P shape] which is at the below of monitor.

9. Release Program Restart Key, the screen will display as below:



10. Please check that if M, S, and T value remain the state when interrupting.

11. In **MDI** mode, execute M and S value which have displayed in the screen.

12. In **AUTO** mode, press **CYCLE/START** button, then X, Y and Z axis will go to the coordinates which N. serial single has commanded. After making sure the position, release **SG./BLK.** button. (When "**Re-open**" disappeared, the axes have returned to the interrupted position.)

13. Press **CYCLE/START** button, then machine can continue to cut.

"Tool damaged" or "Program interrupted" use [P shape] <RESET> ; "Power off" use [Q shape] <EMG>

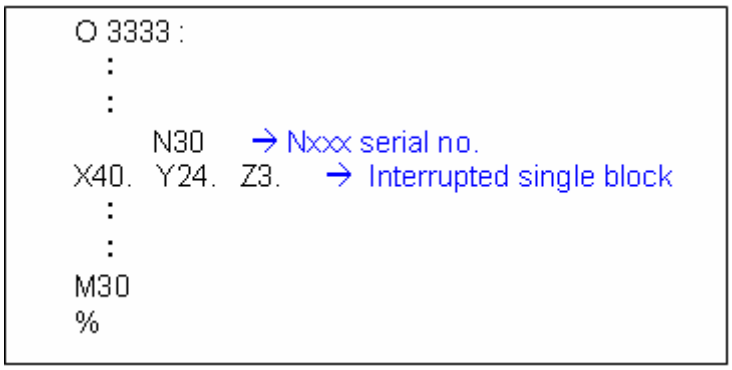
OPEN [PROGRAM RESTART] SOFT KEY STEPS

(0I – PA) 3201.0.2 = 1

MDI → OFS/SET → Next Page → Operate PN → PAGE → SRN → START

By Memory Card:

Ex:



Method 1: Use AUTO mode to restart program.

1. If tool is damaged when machine is executing the cutting program, please press **FEED/HOLD** button immediately and record the coordinates of interrupted position. (If the program has edit N serial no., please record the N no. of interrupted position.)

2. Press **RESET** button. → Move Z axis by hand wheel. → Move tool upward. → Tool will leave work piece.

3. After replacing a new tool, please re-collation tool length and renew tool compensation value.

4. Input G40, G49 and G80 (Cancel commands) in **MDI** mode, then press **CYCLE/START** button to execute it.

5. In **EDIT** mode, edit a new program. (In order to call the program in the memory card.)

```
O2222;              M198 Pxxxx XXXX
M198 P3333;     P= Sub-program executive time (4 numbers)
M30                 XXXX = Next Sub-program no. (4 numbers)
%
```

6. Modify the program in PC. Add N serial no. in front of the interrupted single block. Ex.: Nxxxxx. (If program has edited N serial no. before, it doesn't have to modify N serial no.)

7. Modify program stop: M30 to M99. (Another way is end directly in the sub-program.)

```
O 3333 ;
 :
 :
N30 X40.   Y24.   Z3.
 :
 :
M99
%
```

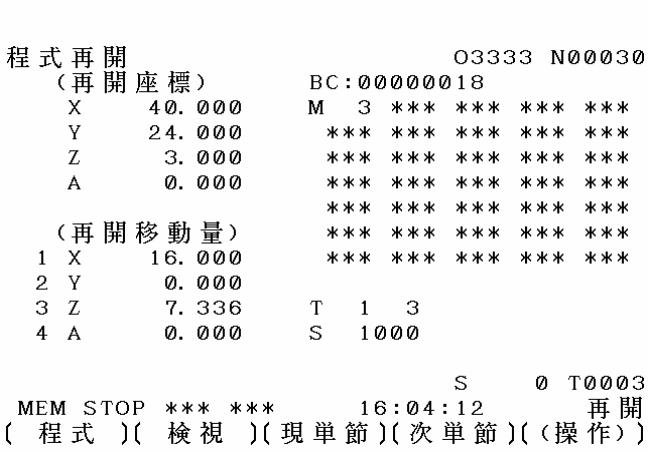
8. In EDIT mode, call program O2222 which has edited.

9. Press **PRO/REST** button and **SG./BLK.** button which are on the Operational Panel.

10. In **AUTO** mode, press **PROG** button. Input serial no.: **30** of interrupted single block. (Not include "N".)

11. Press → button (Next page) which is at the lower right side of monitor. Press soft key [P shape] which is at the below of monitor.

12. Release Program Restart Key, the screen will display as below:



14. Please check that if M, S, and T value remain the state when interrupting.

15. In **MDI** mode, execute M and S value which have displayed in the screen.

16. In **AUTO** mode, press **CYCLE/START** button, then X, Y and Z axis will go to the coordinates which N. serial single has commanded. After making sure the position, release **SG./BLK.** button. (When "**Re-open**" disappeared, the axes have returned to the interrupted position.)

17. Press **CYCLE/START** button, then machine can continue to cut.

"Tool damaged" or "Program interrupted" use [P shape] <RESET> ; "Power off" use [Q shape] <EMG>

RS 232 interface operation

Procedure for setting

For NC setting

To use this function, it is necessary to set the parameter of No.20 I/O CHANNEL to 0 by setting screen.

Setting to I/O CHANNEL to 0: It means using the RS-232 interface.

Follow the next procedure

- Press [EDIT] switch mode selection switch.
- Press [OFFSET SETTING] switch on MDI panel.
- When the [SETTING] soft key is pressed, the following screen is displayed.

1> PARAMETER WRITE setting to 1
2> I/O CHANNEL setting to 0
3> Set the parameter No. 0102 to 1 for input/output device.
4> Set the parameter No.0103 follow next table for baud rate. The value setting same computer setting.
For example set value : 11 baud rate is 9600.

Set value	Baud rate(bps)
8	1200
9	2400
10	4800
11	9600
12	19200

Follow the next procedure

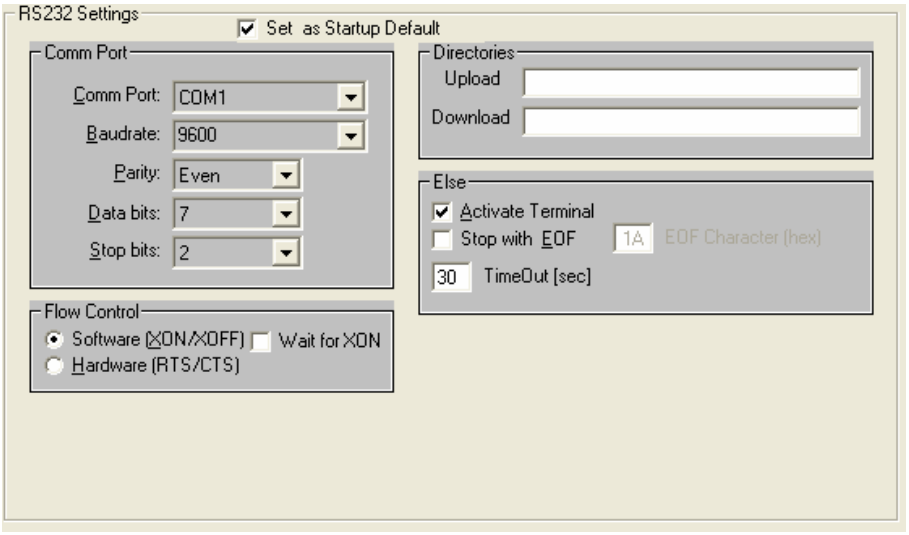
- Press [EDIT] switch mode selection switch
- Press [SYSTEM] on the MDI panel
- Press [PARAM] soft key then the screen is displayed.
- The cursor of next step to find the parameter0102 and 0103 to setting.

For computer setting

Power on computer and executed DNC connect program

For example: DSDNCque.exe

When the DNC connect program is executed the screen show on



Set valve by next step:

Com port : COM1

Baud rate : 9600

Parity : Even

Data bite : 7

Stop bits : 2

Flow Control

SOFT WAY

XON

When [Start] key is pressed the function start.

Select which file is going excite then the file displayed on FILE area and the program shown on right side.

Excite program

When [CYCLE START] button pressed the program is excited.

Memory card operation

Use CF card with transceiver in NC system, the cost will reduce and cheaper. We suggest the Japanese CF card which can get good quality and compatibility. Otherwise you can use the ATA card and does not need transceiver anymore.

I/O channel setting

To use this function, it is necessary to set the parameter of No.20 I/O CHANNEL to 4 by setting screen.

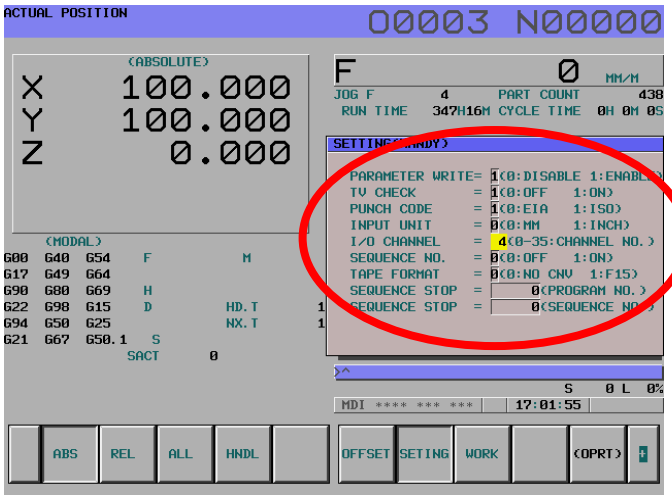
Setting to [I/O CHANNEL[to 4: It means using the memory card interface.

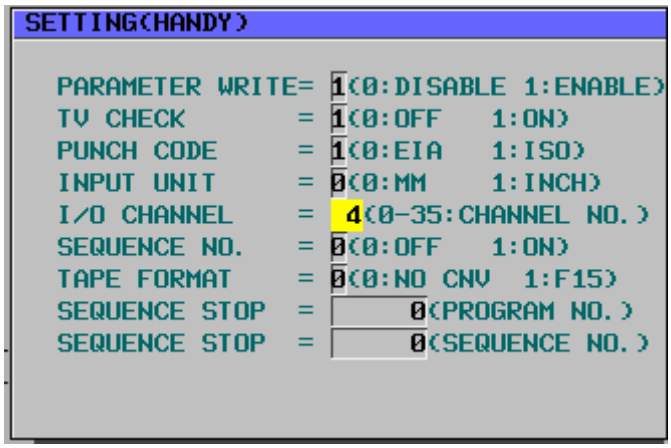
Follow the next procedure

- Press [EDIT] switch mode selection switch.
- Press [OFFSET SETTING] switch on MDI panel.
- When the [SETTING] soft key is pressed, the following screen is displayed.

[PARAMETER WRITE] setting 1

[I/O CHANNEL] setting 4





M code list

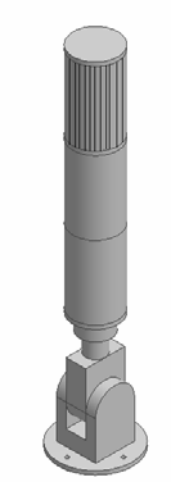
M CODE LIST

STANDARD			OPTION		
NO.	DESCRIPTION 說明	NOTES	NO.	DESCRIPTION 說明	NOTES
M00	PROGRAM STOP 程式停止		M07	COOLANT ON (C.T.S FUNCTION) 刀具中心出水？動	
M01	OPTIONAL PROGRAM STOP 選擇性停止		M27	AIR BLOW (A.T.S FUNCTION) 刀具中心吹氣啓動	
M02	END OF PROGRAM 程式結束		M38	COOLANT ON (THROUGH TOOL KIT) 刀把油路出水？動	
M03	SPINDLE CW 主軸正轉		M40	4th AXIS CLAMPING 旋轉工作台鎖合	
M04	SPINDLE CCW 主軸反轉		M41	4th AXIS RELEASE 旋轉工作台釋放	
M05	SPINDLE STOP 主軸停止		M56	AIR BLOW ON (AT L.M.) 刀具量測吹氣開?	
M06	RUN TOOL CHANGE 自動換刀		M57	AIR BLOW OFF (A.T.L.M.) 刀具量測吹氣關閉	
M08	COOLANT ON (CUTTING) 切削水(油)？動		M81	M81:ON M82:OFF M81啓動 M82取消	
M09	COOLANT OFF (M07/M08/M27/M38) 切削水(油)停止		M82	M81:OFF M82:ON M81取消 M82啓動	
M19	SPINDLE ORIENTATION 主軸定位		M83	M83:ON M84:OFF M83啓動 M84取消	
M29	RIGID TAPPING (Fanuc control) 剛性攻牙		M84	M83:OFF M84:ON M83取消 M84啓動	
M30	END OF PROGRAM M30程式結束		M85	M85:ON M86:OFF M85啓動 M86取消	
M35	TOOL NO. RELOAD 刀表重置功能		M86	M85:OFF M86:ON M85取消 M86啓動	
M47	AIR BLOW ON (CUTTING) 加工吹氣開?		M87	M87:ON M88:OFF M87啓動 M88取消	
M48	AIR BLOW OFF (CUTTING) 加工吹氣關閉		M88	M87:OFF M88:ON M87取消 M88啓動	
M98	SUBPROGRAM CALL 呼叫副程式		M200 Q3	4th AXIS OFF 第四軸關閉	
M99	SUBPROGRAM END 程式循環		M200 Q4	4th AXIS ON 第四軸開?	
M198	RETURN MAIN PRG. (MEMORY CARD) 呼叫副程式(記憶卡)				

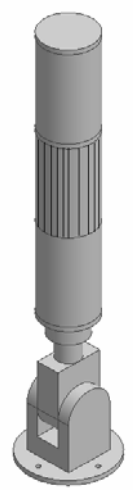
3990190

Note : The label stick on the machine nearby operation box.

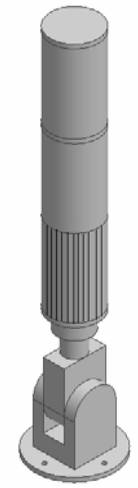
Alarm lit indicate



Appellation	Function & content
Abnormal indicator (red)	This lamp turn on, when the machine gets abnormal state. When any warning is informed, it makes flushing.



Appellation	Function & content
Running indicator (orange)	This lamp turns on when NC machine cycle in process. This lamp turns on also when the tool magazine rotates, ATC is in process. This lamp turns off when Safety Door is opened.



Appellation	Function & content
Machining finish indicator (green)	This lamp turns on when the machined workpiece is in the machine. In case that Operator Call is in process, it makes flushing.

Alarm massage

AL1002 3 AXIS NOT HOME(ATC)

N0	Reason	Normal Situation	Solution to recove
1	After power on three axis did not execute go home position.	After power on, it executes to go home position.	Execute 3 axis to go home position.
2	ATC change not completed.	ATC change completed.	Execute completed ATC change.
3	ATC change not completed.	ATC change completed.	Press [RESET] to clear.

This information above is only for ATC change position on Z axis mechanical coordinate

AL1003 Z AXES NOT 2ND CANCELLED

N0	Reason	Normal Situation	Solution to recove
1	After power on, 3 axis did not execute go home.	After power on, it executes to go home.	Execute 3 axis to go home.
2	ATC change not completed.	Z axis at ATC change position.	Move Z axis back to home position.
3	ATC change not completed.	Z axis at ATC change position.	Press [RESET] to clear.

This information above is only for ATC change position set on Z axis second mechanical coordinate

AL1010 ATC NOT READY

N0	Reason	Normal Situation	Solution to recover
1	Limit switch under tool clamp status did not touch block.	Limit switch needs to be touched with block.	Adjust limit switch or block and make each other touched.
2	Limit switch signal is off under tool clamp status.	X7.1 = 1	Replace limit switch.
3	ATC did not stop at the ATC home position.	Stop at ATC home position.	Reference : ARM maintenance mode operation
4	The signal of sensor for ATC is off.	ATC home position signal X5.7 = 1 X5.6 = 0 X5.5 = 1 X5.4 = 0	Press[EMG], check the signal of sensor that is near ATC. If it is not normal, the replace it.

AL1011 OIL COOLER FAILURE

N0	Reason	Normal Situation	Solution to recover
1	Coolant oil is not enough	Coolant oil can not be lower than the min. line.	Add coolant oil.
2	Oil leak due to the broken oil tubes.	Oil tubes are fine without broken. So no oil leak.	Replace oil tubes.
3	Oil connector loosened.	Fix the oil connector	Fix the loosen connector.
4	Motor overload protector is off.	X4.1 = 1 solenoid valve can not have a short circuit.	Check the related circuit. Press solenoid valve switch clear button.
5	Motor breakdown.	Motor works normally.	Repair or replace the motor.

AL1013 HYDRAULIC MOTOR OVERLOAD

N0	Reason	Normal Situation	Solution to recover
1	Hydraulic pressure is not enough.	Hydraulic system pressure requirement (depending on the items)kg/cm^2	Hydraulic pressure adjust (depending on the items) kg/cm^2
2	Hydraulic box lack of oil.	Hydraulic oil can not be lower than the min. line.	Add hydraulic oil.
3	Oil leak due to the broken oil tubes.	Oil tubes are fine without broken. So no oil leak.	Replace oil tubes.
4	Oil connector loosened.	Fix the oil connector	Fix the loosen connector.
5	Solenoid valve breakdown.	Solenoid valve works normally.	Replace solenoid valve.
6	Hydraulic motor leads the short circuit.	Coil or conducting wire can not have short circuit.	Replace motor or conducting wire.
7	Hydraulic motor breakdown.	Hydraulic motor works normally.	Repair or replace hydraulic motor.

AL1014 CHIP A MOTOR OVERLOAD

N0	Reason	Normal Situation	Solution to recover
1	Motor overload off. ● Conveyor was stuck by the chips. ● Chip conveyor motor can release the gear normally. ● Chip conveyor motor coil has short circuit. ● Chip conveyor motor conducting wire breakdown.	● Conveyor can not accumulate too much chips. ● The outer of the motor can not be covered by other things. ● The solenoid coil of chip conveyor can not have short circuit. ● Conducting wire can not breakdown.	Press [RESET] ● Clean the chips stuck on the conveyor. ● Eliminate the bad heat releasing elements. ● Check the motor. ● Check related circuit.

AL1015 4TH AXIS CLAMPED

N0	Reason	Normal Situation	Solution to recover
1	No execution of unclamp command before the 4^{th} axis rotates.	Execute unclamp command (M41) before the 4^{th} axis rotates.	Execute unclamp command (M41).
2	Oil lead due to the broken oil tube	Oil tubes are fine without broken. So no oil leak.	Replace broken oil tube.
3	Oil connector loosened.	Fix the oil connector	Fix the loosen connector.
4	Solenoid switch broken.	Solenoid switch works normally.	Replace solenoid switch.
5	Oil shortage in hydraulic box.	Oil in hydraulic can not be lower than min. line.	Add hydraulic oil.

Oil tube is same as air tube

AL1016 COOLANT MOTOR OVERLOAD

N0	Reason	Normal Situation	Solution to recover
1	Cutting oil in the coolant tank is not enough.	Cutting oil can not be lower than min. line.	Add cutting oil.
2	Leak due to broken water tube.	Water tubes are fine without broken. So no water leak.	Replace the broken water tube.
3	Water tube connector are loosened.	Fix the water tube connector.	Fix the loosened connector.
4	Solenoid switch breakdown.	Solenoid switch works normally.	Replace solenoid switch.
5	Motor conducting wire has short circuit.	Coil or conduction wire can not have short circuit.	Replace motor or conducting wires.
6	Motor breakdown.	Motor can work normally.	Repair or replace motor.

AL1017 LUBE ALARM CANNOT CYCLE START

N0	Reason	Normal Situation	Solution to recover
1	Lubricating oil is not enough.	Lubricating oil can not be lower than min. line.	Add lubricating oil.
2	Floating switch breakdown.	X6.6 = 1	Replace floating switch.

AL1020 AIR ALARM

N0	Reason	Normal Situation	Solution to recover
1	Air pressure is not enough.	Air pressure requests5~6 kg/cm^2	Supply air pressure more than5~6 kg/cm^2.
2	Air leak due to the broken pressure tube.	Air pressure tubes are fine without broken. So no air leak.	Replace the broken air pressure tubes.
3	Air pressure tube connector loosened.	Fix the air pressure connector.	Fix the loosened connector.
4	Air pessure switch setting is malfunction.	Set the air pressure switch as 4 kg/cm^2.	Set the air pressure switch correctly as 4 kg/cm^2.
5	Air pessure switch setting is broken.	When the pressure arrives, the signal will be sent. X7.7 = 1	Replace air pressure switch or conducting wires.

AL1021 CHIP B MOTOR OVERLOAD

N0	Reason	Normal Situation	Solution to recover
1	Chip B motor overload ● Convey was stuck by chips. ● Chip B motor can not release heat efficiently. ● Chip B motor has short circuit. ● Chip B motor conducting wires broken.	● Convey are not allow to pile up too much chips. ● Must cover nothing on the chip B motor. ● Chip conveyor's solenoid switch wire may not have short circuit. ● The conducting wires can not be broken.	Press [RESET] to recover ● Clean the chips stuck on the conveyor. ● Eliminate the reasons to cause the motor not being releasing the heat. ● Check the motor. ● Check the related wires and cables.

AL1022 GEAR BOX OIL LOW ALARM

N0	Reason	Normal Situation	Solution to recover
1	Lubricating oil is not enough.	Lubricating oil may not be lower than the min. line.	Add the lubricating oil.
2	Oil leak due to broken oil tubes.	Oil tubes are fine without broken. So no oil leak.	Replace broken oil tubes.
3	Oil tube connector loosened.	Fix the oil tube connector.	Fix the loosened connector.
4	Motor conducting wire is broken.	Conducting wires cannot be broken.	Replace the motor or conducting wires.
5	Motor is broken.	Motor can work normally.	Repair or replace motor.
6	Floating switch is broken.	X9.5 = 1	Replace floating switch.

AL1023 NO.OF PARTS REACHED

N0	Reason	Normal Situation	Solution to recover
1	Work piece counter is reached	Please check parameter:6700—6713	After clearing the signal, please press [RESET] or reset parameter.

AL1027 SUCK MOTOR OVERLOAD

N0	Reason	Normal Situation	Solution to recover
1	Motor overload.	When the overload protector not on, the motor can work normally.	After clearing the motor overload, press [RESET] to recover.
2	Overload protector is broken.	After overload protector is on, it can not release.	Replace overload protector.
3	Motor is broken.	Motor can work normally.	Check the motor or replace the motor.
4	Motor wire is loosened or broken.	Motor can work normally.	Lock the connector or replace the wire.

AL 1030 SUCK PERSSURE LOW

N0	Reason	Normal Situation	Solution to recover
1	Blocked	The water output pressure is normal.	Clean the clog.
2	Inspector is broken.		Replace a new one.
3	The water amount is too low.		Add the water.
4	The operating pounds are too low.	The water output pressure is normal.	Adjust the pounds.

AL1031 SUCK FILTER ALARM

N0	Reason	Normal Situation	Solution to recover
1	The filter is stuck.	The water output pressure is normal.	Replace a new one.

AL1032 SUCK LOW LEVEL

N0	Reason	Normal Situation	Solution to recover
1	Fluctuating switch reaction is wrong.	The water output pressure is normal.	Clean clog or water amount is normal.
2	Fluctuating switch has no reaction.	The water output pressure is normal.	Replace a new one.
3	Reaction switch has wrong location.	Reaction is normal.	Adjust reaction location.
4	Reed switch has no reaction.	Reed switch is on.	Make sure the wire is located in the correct position.
5	Reed switch has no reaction.	Reed switch is on.	Replace a new one.

AL1033 SUCK HIGH LEVEL

N0	Reason	Normal Situation	Solution to recover
1	Fluctuating switch reaction is wrong.	The water output pressure is normal.	Clean clog or water amount is normal.
2	Fluctuating switch has no reaction.	The water output pressure is normal.	Replace a new one.
3	Reaction switch has wrong location.	Reaction is normal.	Adjust reaction location.
4	Reed switch has no reaction.	Reed switch is on.	Make sure the wire is located in the correct position.
5	Reed switch has no reaction.	Reed switch is on.	Replace a new one.

AL1034 TANK LOW LEVEL

N0	Reason	Normal Situation	Solution to recover
1	Water amount is not enough.	Water amount is normal.	Adjust the water amount.
2	Fluctuating switch has wrong reaction.	Reaction normal.	Clear clog.
3	Fluctuating switch has no reaction.	Reaction normal.	Replace a new one.
4	Fluctuating switch has wrong reaction.	Reaction normal.	Replace a new one.

AL1035 TANK HIGH LEVEL

N0	Reason	Normal Situation	Solution to recover
1	Water amount is too much.	Water amount is normal.	Adjust the water amount.
2	Fluctuating switch has wrong reaction.	Reaction normal.	Clear clog.
3	Fluctuating switch has no reaction.	Reaction normal.	Replace a new one.
4	Fluctuating switch has wrong reaction.	Reaction normal.	Replace a new one.

AL1036 NEED PMC K6.3=1

N0	Reason	Normal Situation	Solution to recover
1	Setting wrong.	No alarm.	Set K6.3=1 or 0

AL1037 TANK/SUCK LOW LEVEL

N0	Reason	Normal Situation	Solution to recover
1	Water amount is not enough.	Water amount is normal.	Adjust the water amount.
2	Reaction switch is wrong.	Water amount is normal.	Clear clog or adjust the water amount.
3	Reaction switch has no reaction.	Reaction normal.	Check or replace a new one.
4	Reaction switch location is wrong.	Reaction normal.	Adjust reaction location.
5	Fluctuating switch has wrong reaction.	Reaction normal.	Replace a new one.

AL1040 TANK/SUCK HIGH LEVEL

N0	Reason	Normal Situation	Solution to recover
1	Water amount is not enough.	Water amount is normal.	Adjust the water amount.
2	Reaction switch is wrong.	Water amount is normal.	Clear clog or adjust the water amount.
3	Reaction switch has no reaction.	Reaction normal.	Check or replace a new one.
4	Reaction switch location is wrong.	Reaction normal.	Adjust reaction location.
5	Fluctuating switch has wrong reaction.	Reaction normal.	Replace a new one.

AL2041 LUBE LOW LEVEL

N0	Reason	Normal Situation	Solution to recover
1	Fluctuating switch has wrong reaction.	Oil amount is normal.	Check or replace a new one.
2	Reaction switch has no reaction.	Reaction normal.	Check or replace a new one.
3	Oil amount is not enough.	Oil amount is normal	Add oil.

AL1043 TOOL CLAMP/UNCLAMP BUTTON

N0	Reason	Normal Situation	Troubleshooting
1	Limit Switch of cylinder is not at the correct position	Limit Switch of cylinder is at the correct position	Press RESET to recover after troubleshooting

AL 1045 ATC DOOR OPEN

N0	Reason	Normal Situation	Troubleshooting
1	ATC does not go to the orient position	Air pressure is normal	Check the air pressure
2	Limit Switch has no action	SENSOR damaged	Inspect or replace new parts
3	ATC door is not at the correct position	ATC door close	Close ATC door

AL 1046 SPINDLE CUTTING OVERLOAD

N0	Reason	Normal Situation	Troubleshooting
1	Spindle has loaded to the limit or overload time has reached.		Press RESET to recover after troubleshooting

AL 1047 LUBE PRESSURE LOW

N0	Reason	Normal Situation	Troubleshooting
1	Oil lubes are loose		Lock the oil tubes back
2	Oil lubes are broken		Replace new parts
3	Oil distributor will leak		Inspect or replace new parts
4	Oil can not pump out	Oil pressure is normal	Inspect or replace new parts

AL 1050 ATC OPERATION ERROR

N0	Reason	Normal Situation	Troubleshooting
1	Tool no. error		Check the operation method
2	Operation error		Check the operation method

AL 1051 ATC LS FAULT

N0	Reason	Normal Situation	Troubleshooting
1	Limit Switch for tool pocket up/down isn’t normal	Limit Switch is at normal position	Inspect or replace new parts
2	Limit Switch for cylinder isn’t normal	Limit Switch is at normal position	Inspect or replace new parts

AL 1052 ATLM FAULT

N0	Reason	Normal Situation	Troubleshooting
1	Tool damaged	Inspect or replace new parts	Replace the tool
2	Setting error	Inspect or replace new parts	Check the setting

AL1054 MAGAZINE POCKET UP/DOWN=0

N0	Reason	Normal Situation	Troubleshooting
1	Limit Switch for tool pocket up/down isn't normal	Limit Switch is at normal position	Inspect or replace new parts
2	Tool pocket isn't at correct position	Tool pocket is at correct position	Exchange the position for tool pocket up/down

AL1056 A AXIS NEED HOME

N0	Reason	Normal Situation	Troubleshooting
1	A axis go HOME		A axis go HOME

AL1060 TIMEOUT MONITOR .TOOL MAGAZINE

N0	Reason	Normal Situation	Troubleshooting
1	The time of magazine action is too long	Normal action	Reset the checking time
2	Motor of Magazine damaged	Inspect or replace new parts	Inspect or replace new parts
3	Limit Switch of Magazine damaged	Inspect or replace new parts	Inspect or replace new parts

AL 1061 TOOL EXCHANGE OVER 100000 TIMES

N0	Reason	Normal Situation	Troubleshooting
1	Tool change over 100,000 times		Press RESET to recover after troubleshooting

AL1062 NEED CYCLE START

N0	Reason	Normal Situation	Troubleshooting
1	Program stop	Normal action	Press RESET to recover after troubleshooting

AL 1064 T COMMAND > 98

N0	Reason	Normal Situation	Troubleshooting
1	Call the wrong tool no.	Normal action	Press RESET to recover after troubleshooting

AL 1065 POCKET IS OCCUPIED BY OV.SIZE T

N0	Reason	Normal Situation	Troubleshooting
1	Size of tool pocket is too big		Check the size

AL1066 T NO. NOT REGISTERED

N0	Reason	Normal Situation	Troubleshooting
1	Tool no. error	Normal action	Check the setting of tool no.
2	Tool no. doesn't set	Normal action	Check the tool list

AL 1067 CAN NOT CALL TO

N0	Reason	Normal Situation	Troubleshooting
1	Tool no. can not be found	Normal action	Check the tool list
2	Tool no. can not be found	Normal action	Check the program

AL 1075 MAG POCKET ARE FULL

N0	Reason	Normal Situation	Troubleshooting
1	ATC is full		Check the tool q'ty

AL 1076 MAG MOTOR OVERLOAD

N0	Reason	Normal Situation	Troubleshooting
1	Motor overloaded	When Overload Protector does not start, the motor still can operate normally	Press RESET to recover after troubleshooting
2	Overload Protector damaged	When Overload Protector starts, it can not banish.	Replace a new Overload Protector
3	Motor damaged	Motor can operation normally	Inspect the motor or replace a new motor
4	Cables of Motor have loose or broken	Motor can operation normally	Lock the joints tightly or replace the new cables

AL 1077 ARM MOTOR OVERLOAD

N0	Reason	Normal Situation	Troubleshooting
1	Motor overloaded	When Overload Protector does not start, the motor still can operate normally	Press RESET to recover after troubleshooting
2	Overload Protector damaged	When Overload Protector starts, it can not banish	Replace a new Overload Protector
3	Motor damaged	Motor can operation normally	Inspect the motor or replace a new motor
4	Cables of Motor have loose or broken	Motor can operation normally	Lock the joints tightly or replace the new cables

AL 1080 CHECK POCKET NO. /COUNT 1 NO

N0	Reason	Normal Situation	Troubleshooting
1	ATC can not tool-change		Check the tool list
2	ATC tool no. error		Check the tool no.
3	ATC can not tool-change		Check the program

AL 1082 GEAR CHANGE NOT FIN

N0	Reason	Normal Situation	Troubleshooting
1	Cables are loose or broken	Power normal	Lock the joints tightly or replace cables
2	Gear-change can not completed	Normal action	Stop rotating, then try again.
3	Gear-change can not completed	Normal action	Test K2.3K2.4=0&1 by manual

AL 1083 GEAR POSITION ERROR

N0	Reason	Normal Situation	Troubleshooting
1	Cables are loose or broken	Power normal	Lock the joints tightly or replace cables
2	Gear-change can not completed	Normal action	Stop rotating, then try again.
3	Gear-change can not completed	Normal action	Test K2.3K2.4=0&1 by manual

AL 1084 ELECTROMAGNET TRAY NEED ON

N0	Reason	Normal Condition	Troubleshooting
1	Magnetic valve damaged	Normal action	Inspect or replace the Magnetic valve

AL 1085 ELECTROMAGNET TRAY / SENSOR FAILURE

N0	Reason	Normal Condition	Troubleshooting
1	SENSOR attached the foreign matters	Normal action	Clear the foreign matters
2	Sense error	Normal action	Replace new parts

AL 1086 Z AXIS OVERLOAD

N0	Reason	Normal Situation	Troubleshooting
1	Motor overloaded	When Overload Protector does not start, the motor still can operate normally	Press RESET to recover after troubleshooting or power off.
2	Motor damaged	Motor still can operate normally	Inspect the motor or replace a new motor
3	Cables of motor has loose or broken	Motor still can operate normally	Lock the joints tightly or replace cables

AL 1087 TOOL BROKEN

N0	Reason	Normal Situation	Troubleshooting
1	Tool damaged		Replace a new Tool

AL 1090 PMC K5.4=1

N0	Reason	Normal Situation	Troubleshooting
1	Execute Manual tool-change (Clockwise)	Auto tool-change K5.4=0	Modify K5.4=0

AL 1091 PMC K5.5=1

N0	Reason	Normal Situation	Troubleshooting
1	Execute Manual tool-change (Clockwise)	Auto tool-change K5.5=0	Modify K5.5=0

AL 1092 PMC K13.6=1

N0	Reason	Normal Situation	Troubleshooting
1	Setting error		Modify K13.6=1 or 0

AL 1093 PMC K6.0=1

N0	Reason	Normal Situation	Troubleshooting
1	Execute Manual tool-change (Counter-clockwise)	Auto tool-change K6.0=0	Modify K6.0=0

AL 1094 PMC K12.0=1

N0	Reason	Normal Situation	Troubleshooting
1	Setting error		Modify K12.0=1 or 0

AL 1095 PMC K6.7=1

N0	Reason	Normal Situation	Troubleshooting
1	Setting error		Modify K6.7 =1 or 0

AL 1096 TOOL OVERLOAD

N0	Reason	Normal Situation	Troubleshooting
1	Motor overloaded	When Overload Protector does not start, the motor still can operate normally	Press RESET to recover after troubleshooting
2	Overload Protector damaged	When Overload Protector starts, it can not banish	Replace a new Overload Protector
3	Motor damaged	Motor can operation normally	Inspect the motor or replace a new motor
4	Cables of Motor have loose or broken	Motor can operation normally	Lock the joints tightly or replace the new cables

AL 1097 TOOL BROKEN

N0	Reason	Normal Situation	Troubleshooting
1	Tool damaged		Replace a new Tool

How to repair magazine Counter Error

For Fanuc controller & ARM Type ATC

Repair procedure

1> Take off all the tools which are on the Tool Magazine.

2> Turn Tool Pocket #1 to tool-change position. Please refer Picture 1.

3> Please make sure there's no tool in the spindle. Please refer Picture 2.

4> Execute MDI→M35→Cycle start。

5> Check the "Tool List". Please refer Picture 3.

6> Please install the tools according to the sequence in Tool List.

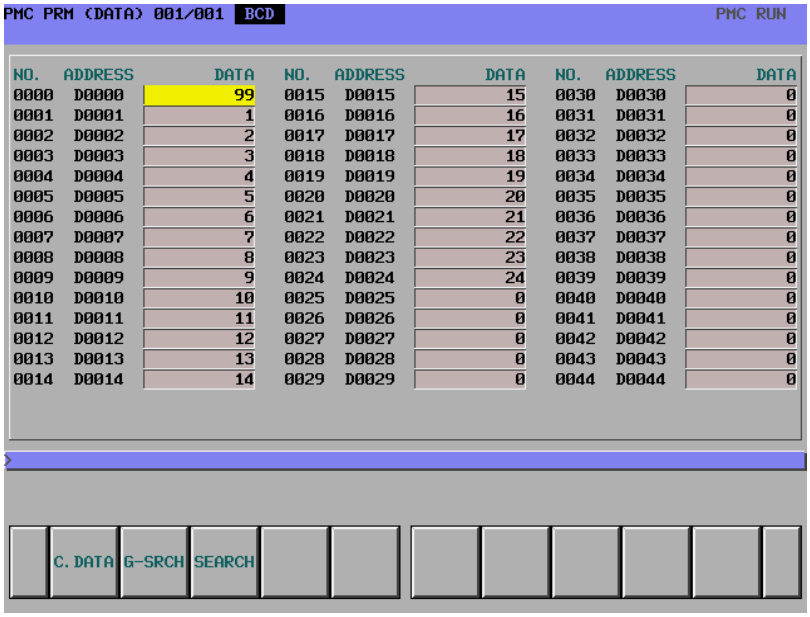
Picture 1

Picture 2: no tool in the spindle

Check the "Tool List".

Picture 3:

[SYSTEM]→ [PMCPRM] → [DATA] → [G.DATA]



NO.	ADDRESS	DATA	NO.	ADDRESS	DATA	NO.	ADDRESS	DATA
0000	D0000	99	0015	D0015	15	0030	D0030	0
0001	D0001	1	0016	D0016	16	0031	D0031	0
0002	D0002	2	0017	D0017	17	0032	D0032	0
0003	D0003	3	0018	D0018	18	0033	D0033	0
0004	D0004	4	0019	D0019	19	0034	D0034	0
0005	D0005	5	0020	D0020	20	0035	D0035	0
0006	D0006	6	0021	D0021	21	0036	D0036	0
0007	D0007	7	0022	D0022	22	0037	D0037	0
0008	D0008	8	0023	D0023	23	0038	D0038	0
0009	D0009	9	0024	D0024	24	0039	D0039	0
0010	D0010	10	0025	D0025	0	0040	D0040	0
0011	D0011	11	0026	D0026	0	0041	D0041	0
0012	D0012	12	0027	D0027	0	0042	D0042	0
0013	D0013	13	0028	D0028	0	0043	D0043	0
0014	D0014	14	0029	D0029	0	0044	D0044	0

Reloading tools into magazine and register the data into management first before load the tool.