

ZX-4 MANUAL

Table of contents

Chapter 1 Precautions for safe operation.....	3
1. Introduction.....	3
2. Safety precautions.....	3
3. Preparation and checklist of the machine purchaser.....	7
4. Precautions for users regarding the use of the equipment.....	7
Chapter 2 Equipment Information.....	8
1. Equipment outer appearance.....	8
2. Equipment specifications.....	9
3. Stroke of each axis and return zero position.....	10
4. Relationship between tool length and index.....	11
5. Relationship between tool length and Z sensor.....	12
Chapter 3 Installation and setup.....	13
1. Machine installation method.....	13
2. Equipment movement and transportation.....	14
Chapter 4 PC-NC Controller.....	15
1. Monitor.....	15
2. Equipment turning on and off.....	16
3. Machine zero return (ZRN).....	18
4. Manual operation (JOG).....	19
5. Automatic operation (AUTO).....	20
Chapter 5 Maintenance and management.....	24
1. ATC system.....	24
2. Pneumatic systems.....	25
3. Coolant system.....	26
4. Daily and periodic check-up.....	27
Chapter 6 Response to the alarm occurrence.....	28

Chapter 1 Precautions for safe operation

1. Introduction

Thanks for purchasing the products of MANIX Co. Ltd.

This user manual describes precautions and safety precautions for your sufficient safety and precautions.

Careless preparation and operation can be a cause of unexpected accidents during the operation.

Please read all instructions and understand all details before you use the machine.

2. Safety precautions

2.1 Precautions

The following indicated items explain the features of the equipment, types, functional requirements and elements mounted.

To prevent dispersion of chips, other dusts, and tools, please follow the operation according to the subsequent safety conditions. To prevent fatal accidents due to damage of the equipment and other erroneous operations, it is highly important to follow the safety precautions and appropriate controls.

To prevent non-professionals from handling the devices, attention on the equipment is required as well as operating the equipment safely.

To prevent physical damage from the machine, please follow all safety precautions, handling instructions and installation guide recorded in this manual.

2.2 Safety guidelines

For the prevention of accidents, the following precautions must be kept!

All operations must follow the instructions in this manual and notice the end users regarding the all preparations for the installation.

2.2.1 Please read this manual thoroughly and carefully.

- (1) Please be familiar with the potential and limited specific application items of the tools and mechanical details.
- (2) Please do not install the product arbitrarily or disassemble the inside of the product as well as repairing and replacing some parts.

2.2.2 Avoid dangerous surrounding work environment

- (1) Do not operate the equipment in a wet or moisture place.
- (2) Do not install the machine in the bright place.
- (3) Do not install the machine in the dry place or condition.
- (4) Do not install the equipment near heat or place where fire can occur.
- (5) Use the machine cleanly always.
- (6) Place the machine in the horizontal position.

2.2.3 Be careful about electric shock.

To prevent electric fire shock or explosion, grounding must be done properly.

- (2) "Power OFF" must be checked before connecting the power line.
- (3) Once power is on, do not touch electric boxes and circuits.
- (4) If the inspection on electric parts is required, manufacturer's approval must be obtained.
- (5) If machine warming or inspection is required, the power switch is turned "ON" followed by standing by for about five minutes to check all parts are ready to operate safely.
- (6) During the machine operation, do not touch the machine with wet hands.

2.2.4 Wear the appropriate cloth for operations

- (1) Wear appropriate cloth for operations.
Loose clothes may be caught in the part or machine inadvertently.
- (2) Dusts can be generated during operations so if required, wear a face protective band or mask.
- (3) If hair condition of an operator is too long, tie the hair to operate the machine.

2.2.5 Inspect whether the parts are correctly attached.

- (1) Do not shock the machine.
- (2) Prior to the operation of the machine, check all the parts are correctly attached. Incorrect attachments can cause malfunction and problems.

2.2.6 Install the machine in a place where maintenance is convenient

- (1) Clean the surrounding place of the machine.

Work in a clutter environment may increase careless accidents.

- (2) Put away unnecessary items around the operation space.
- (3) The operation space should have enough space to put or remove the equipment.

2.2.7 Keep children or unskilled operators away from the machine.

- (1) Keep all visitors to take safety precautions and maintain safety distance.
- (2) It is necessary to be careful for children or unskilled operators not to touch the main switches and operation keys of the machine.

2.2.8 Store the machine under the optimum condition.

- (1) Keep the machine clean at all times.
- (2) Please keep the dusts and chips occurred during the operation away from the machine and remove them since they may be stuck to the parts and interfere with the reliable operation of the machine.
- (3) In case of sudden breakage occurrence, remove the problem immediately and check the safety status.
Ensure the machine is safe before it is re-run.
- (4) The surrounding temperature of the installation place shall maintain 2°C to 32°C for the operation.

2.2.9 Use the standard parts

- (1) Use the genuine parts and following the manual.
Irregular or non-standard parts may cause problems to the machine.

2.2.10 Other safety precautions

- (1) Do not dispose of industrial wastes and parts irresponsibly.
Please follow the specified management and disposal procedure for industrial wastes.
- (2) Follow the manual for the installation and movements of the machine according to the machine load.

2.3 Safety for the machine use

- (1) Avoid contact with the machine during the operation
- (2) Do not operate the machine while opening the door of the machine.
- (3) While the main axis is rotated, avoid contact with the machine.
- (4) Do not remove the safety device.
- (5) Do not use the flammable materials.
- (6) Do not use the controller PC during the machine operation except for the purpose of the machine operation.
- (7) Be familiar with the safety guidelines specified in the user manual of the machine.

2.4 Electricity-related safety precautions

- (1) Make sure that the safety of the work place is the most priority.
- (2) The use power must be supplied with specified voltage.
- (3) Avoid wet and humid places for the machine operation.
- (4) Do not touch the machine with wet hands under no circumstance.
- (5) A circuit breaker must be installed in the input terminal of the power supply
- (6) Earth must be installed. (Grounded capacitors used)
- (7) Do not disassemble or remove the electric parts already installed arbitrarily.
- (8) Power must be turned off before the machine is moved.
- (9) Check frequently whether the power cords connected to the machine are not broken.
- (10) Do not mount the parts by replacing or modifying them arbitrarily.

3. Preparation and checklist of the machine purchaser

◆ Computer designer and operator

- Do you have an employee who is good at computer operations?
- Make sure that there is personnel who can design using CAD/CAM or software for the dental purpose.

◆ Software for design

- Do you have suitable software for dental design?
e.g.) DentCAD, XO CAD, 3SHAPE CAD etc.

◆ Place for the machine installation

- Do you have suitable places for machine installation?

◆ Power source

- 220V single-phase installation (depending on the optional power)

◆ User training

- Users who operate the equipment

4. Precautions for users regarding the use of the equipment

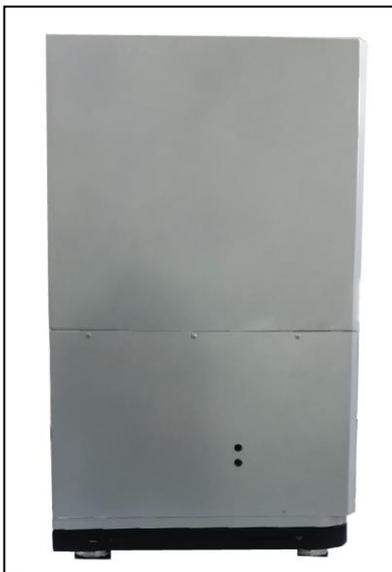
- (1) Clean the place around the machine.
- (2) Do not shock the equipment excessively.
- (3) Check the power grounding condition and power imbalance (due to high-frequency effect) frequently.
- (4) Make sure that the rubber feet under the table are correctly fixed to hold the equipment firmly.
- (5) Make sure that the surrounding temperature of the installation place maintains 2°C to 32°C.
- (6) Make sure that the pneumatic gauge scale of the air unit is in a range of 0.5 to 0.6MPa.
- (7) Make sure that the parts are not damaged during cleaning and do not use air blower.
- (8) Be careful to avoid computer virus while using USB memory sticks or local area networks.
- (9) The PC controller should be terminated properly always.

(Internal data may be damaged if the PC controller is terminated abnormally due to power outage.)

- (10) Inspect the wear condition of the tool edges due to the use of the tools for processing.

Chapter 2 Equipment Information

1. Equipment outer appearance



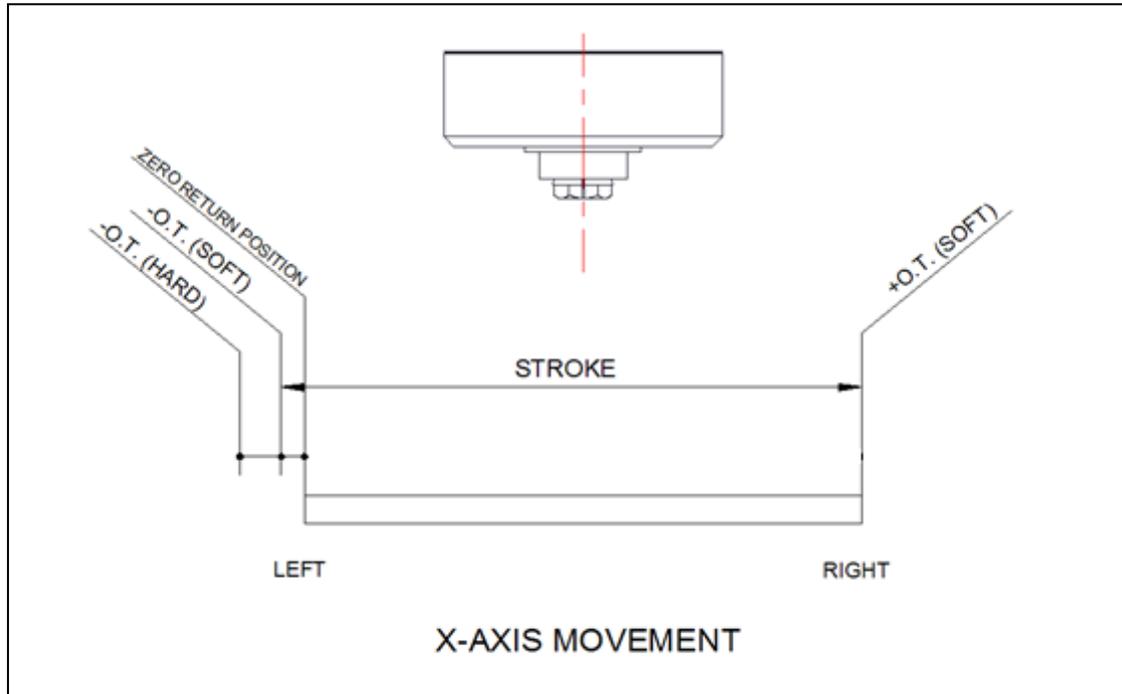
2. Equipment specifications

<Table 1>

	Item	Unit	Specification
Feed distance	X-axis	mm	130
	Y-axis	mm	125
	Z-axis	mm	150
	A-axis	deg	0-360
Spindle	Spindle revolution	r.p.m , W	High Frequency 42,000 , 500W
	Spindle collet	∅	8.5
	Collet size	∅	CHR - 4
Feed	Rapid feed rate	mm/min	5500
	Cutting feed rate	mm/min	1-5500
Automatic tool exchange device	Tool connection mode	-	Direct connection
	The number of tools held	EA	6
	Tool shank diameter	∅	4
	Maximum tool diameter	∅	3
	Maximum tool length	mm	30
	Tool selection method	-	Fixed type
	Tool exchange time	sec	30
Machine dimension	width and depth		400 * 405
	Machine height		680
	Machine main body weight	kg	55
Holder dimension	Width and depth of holder		520 * 520 (option)
	Height of holder		720 (option)
	Weight of holder		51 (option)
Other	Drives	-	Precise ball screw
	Driving Motor	-	DC Servo
	CNC SYSTEM	-	MM3
	Power supply		220V, Max. 5A
	Air pressure	MPa	0.6

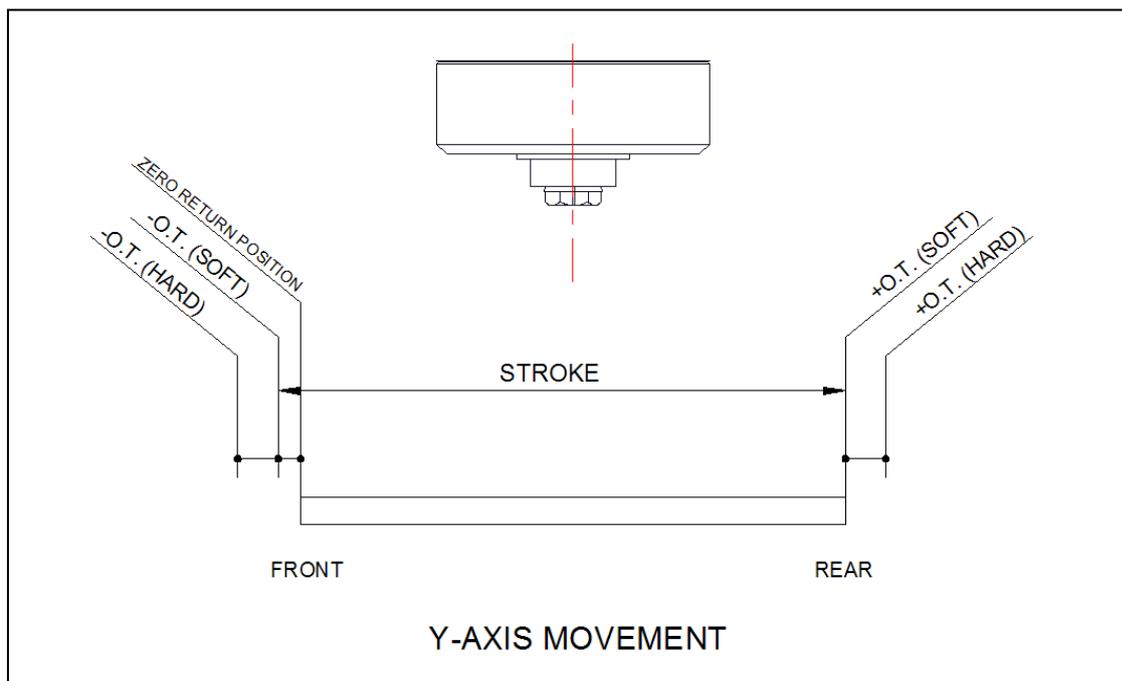
3. Stroke of each axis and return zero position

3.1 X-axis stroke = 130mm



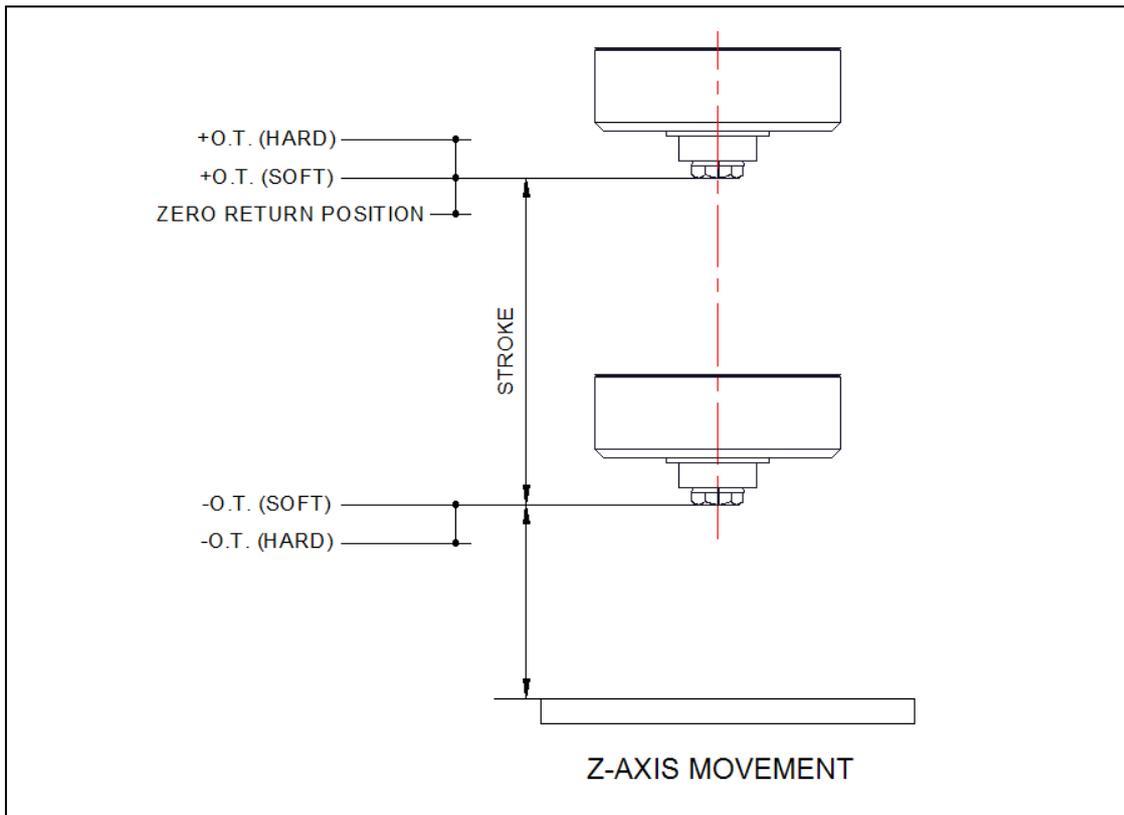
<Fig. 1>

3.2 Y-axis stroke = 125mm



<Fig. 2>

3.3 Z-axis stroke = 80mm



<Fig. 3>

4. Relationship between tool length and index

If the tool is clamped by the spindle and protruded total length A is too long, the index may be interfered during rotation, resulting in collision.

The maximum length of A is 30mm, and if A length is longer than B length, a tool position will be deviated from the radius of the index rotation.

Thus, it is important to make sure the index is rotated safely.

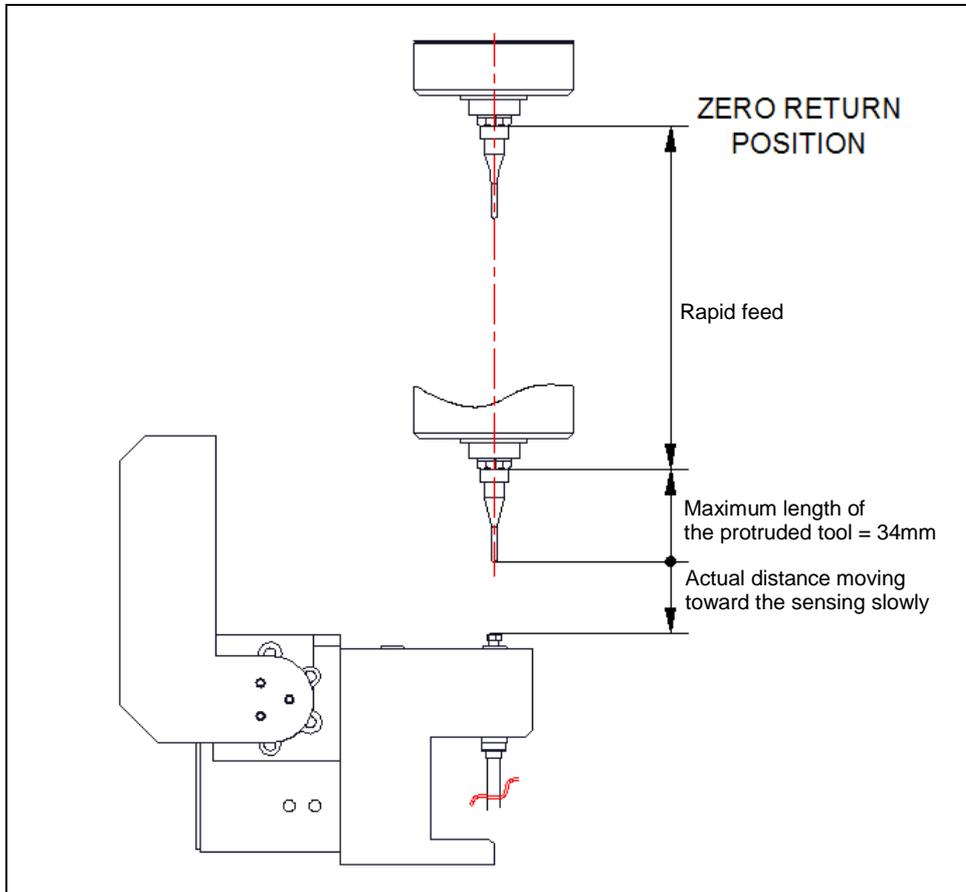


<Fig. 4>

5. Relationship between tool length and Z sensor

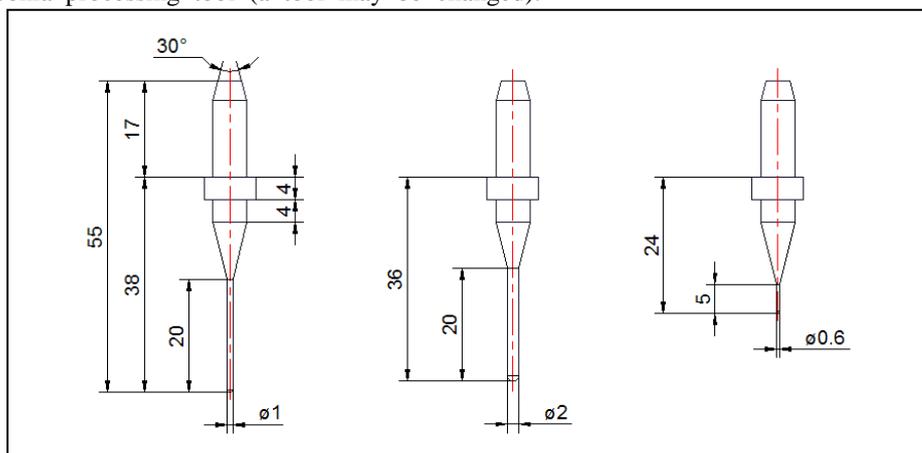
The total projected length of the tool clamped to the spindle shall be less than 30mm.

If the projected length exceeds 30mm, it may be sensed as a rapid feed so that accurate dimension may not be produced.



<Fig. 5>

◆ Note: Zirconia processing tool (a tool may be changed).



<Fig. 6>

Chapter 3 Installation and setup

1. Machine installation method

1.1 Safe installation method of the machine

1.1.1 Mechanical part

- (1) The machine should be placed on the floor where the machine's load can endure.
- (2) While putting a leveler on the machine table and checking the level, the rubber feet are fixed on the ground.
- (3) Air is supplied to the air unit and check the pressure of 0.55~0.6 MPa in the pressure gauge.
- (4) Check whether the cables are correctly connected.

1.1.2 Power connection and operation

- (1) A plug is inserted to the 220V single phase capacitor, which is grounded. (It may differ country to country.)
- (2) Push the POWER ON button in the front panel of the equipment. (Lighting is on.)
- (3) Push the flashing EMG/RESET button to connect the equipment with the software. (Flashing will disappear.)
- (4) Push the ZRN at the right upper end to return to the machine zero.

- Checklist for the commissioning test-

- ◆ At MENU MODE, (click the Manix Logo in the right upper end and push the MENU.MODE button.)
 - Check whether TYPE of feed JOG at each of the axes (X+, X-, Y+, Y-, Z+, Z-, A+, A-) is CONT.
 - Check whether the spindle is rotated correctly (SPINDLE [ON] / SPINDLE [OFF]).
 - Check the spindle collet operation COLLET [CLAMP] / COLLET [UNCLAMP].
 - Check the cover operation in the tool magazine ATC DOOR [OPEN] / ATC DOOR [CLOSE].
 - Check whether a coolant is flowed correctly (COOLANT [ON] / COOLANT [OFF]).
 - Check whether the tool exchange is running correctly (push T1 to T6 in AUTO TOOL CHANGE).

- ◆ In the AUTO mode
 - Check whether the file is introduced correctly. (Using the OPEN button, select the file.)
 - Run the machine with sample processing over the air.
 - Try sample processing.

2. Equipment movement and transportation

If the equipment is placed on the work table, move the equipment by pushing the work table.



Place the hand below the lower end and lift it.

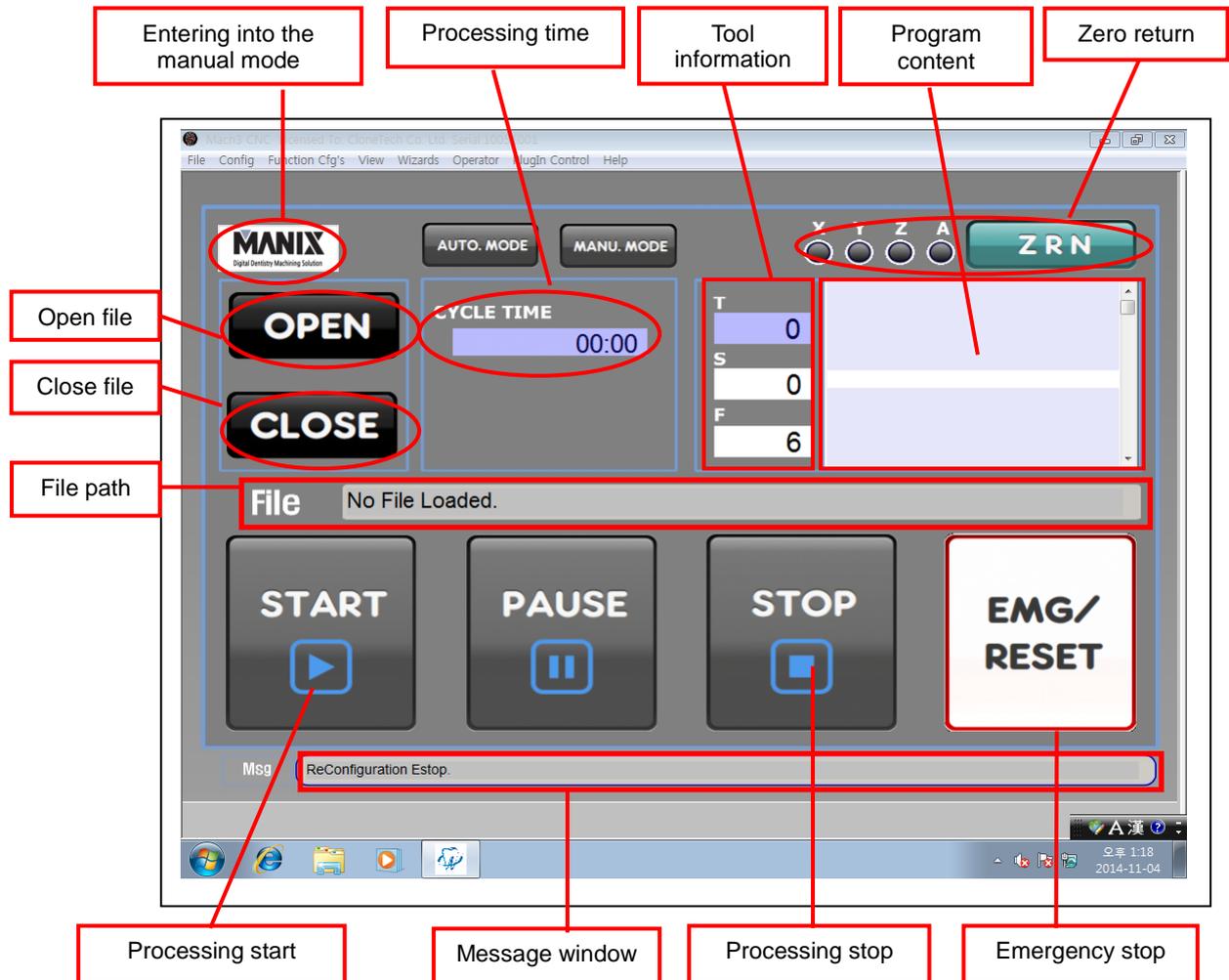
※ Be careful about impact during transportation.

Chapter 4 PC-NC Controller

1. Monitor

1.1 Configuration of the operation program screen

All the information related to the equipment is shown in this monitor.



<Fig. 1>

1.2 Input device

Since the monitor uses the resistive touch input, touch the screen softly to select menus.

- ◆ If touch pointer is not placed in the touch point, calibration is required.
(You can calibrate at eGalax Touch in the right lower end of the screen.)



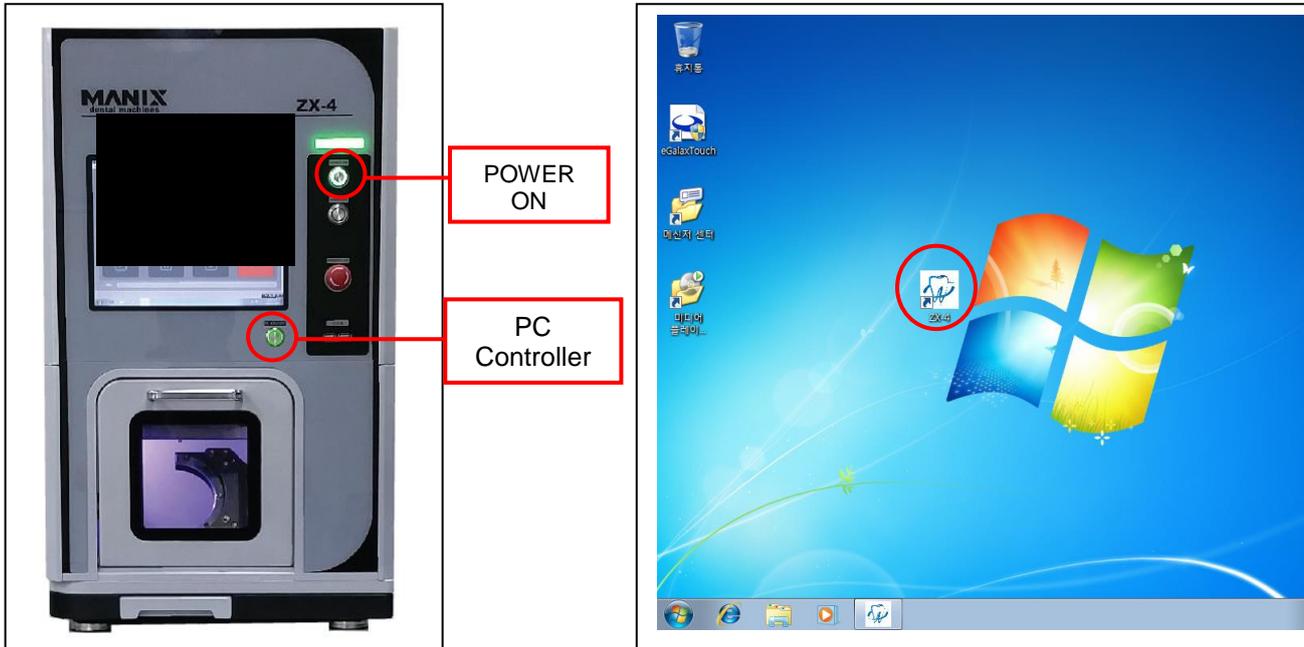
<Fig. 2>

2. Equipment turning on and off

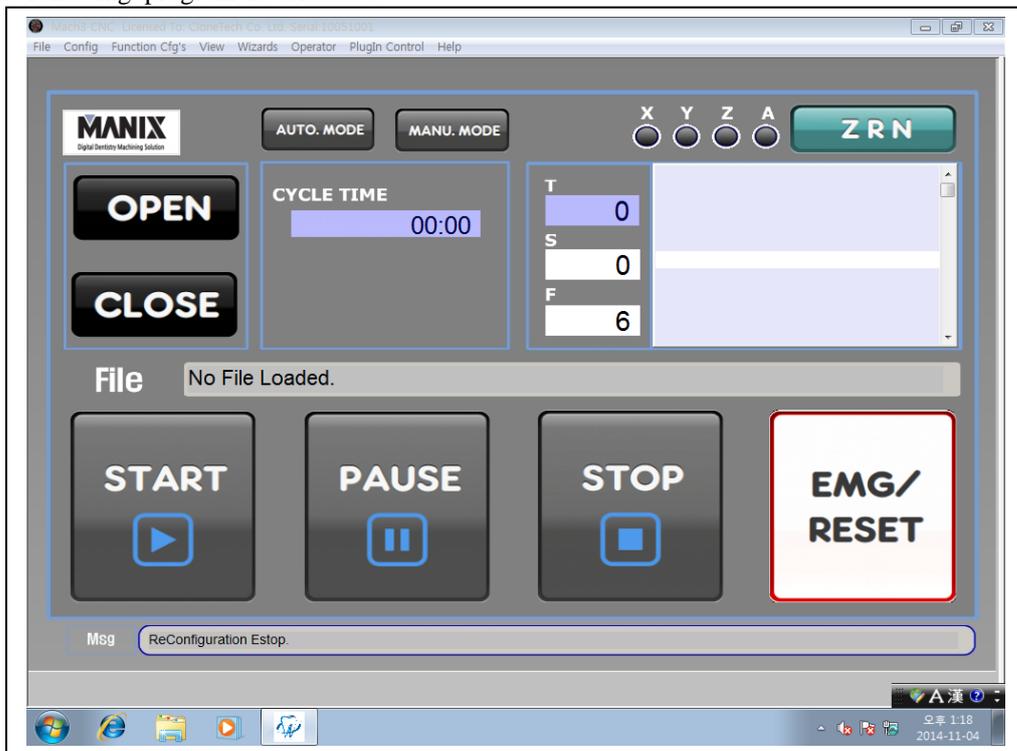
2.1. Equipment turning on

To run the equipment, both of the mechanism unit and PC controller should be turned on.

- (1) Push the POWER ON button in the mechanism unit.
- (2) POWER ON the PC controller.
- (3) Double click the ZX-4 icon in the desktop.



- (4) the following program is executed.



<Fig. 5>

2.2. Equipment turning off

To turn off the equipment, both of PC controller and machine unit should be turned off.

(1) Release the connection between the machine and the controller - EMG/RESET button (Flashing light upon the release).

(2) Push X (Close) button in the right upper end.



<Fig. 6>

(3) Push the POWER OFF button in the machine power. (Machine unit)



<Fig. 7>

3. Machine zero return (ZRN)

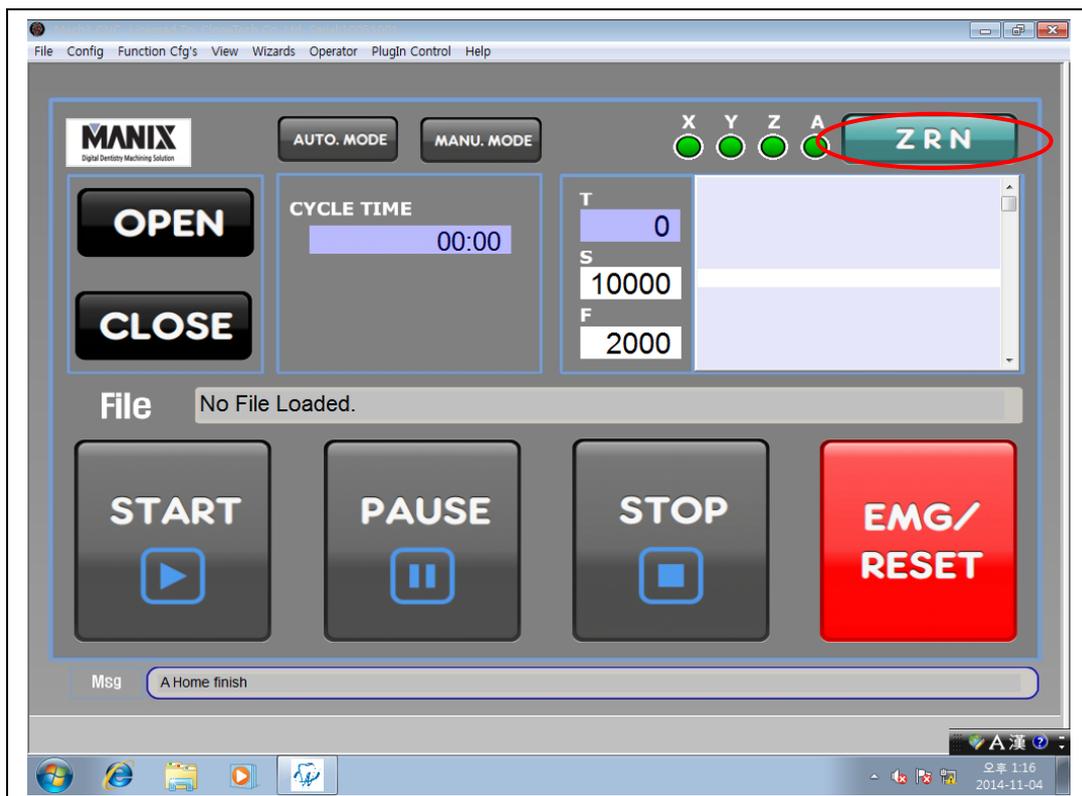
This equipment is a machine to control numerically, which is why we set up an arbitrary reference point. Using this reference point, a fixed position can be determined through the return to machine zero to maintain a constant coordinate value.

In general, machine zero return must be performed after POWER ON of CNC device.

Push the ZRN button in the right upper end in the main screen. (It will be completed when all the lamps, X, Y, Z, A, and B in the left side are lit.)

※ Precaution

1. 1. It is preferable to avoid zero return again in the machine zero position. If necessary, it is recommended to perform ZRN after departing from the machine zero using the JOG mode.
2. It is better to have a warming up for 10 min. or longer prior to the first equipment operation after no operation for a long time.
3. It will be completed when all the green indicator lights are lit on the X, Y, Z, and A lamps in the left side in the ZRN button.



<Fig. 8>

4. Manual operation (JOG)

Using the JOG, the machine can be moved to any arbitrary position in three axes.

In addition, COLLET CLAMP/ UNCLAMP and ON/OFF in the SPINDLE can be run including manual operation of ATC.

◆ Precaution

1. When each axis is moved, it should be careful not to collide with the spindle axis, the index, and the tool post.
2. If an over-travel alarm occurs while moving each axis, move the axis in the opposite direction to stop the alarm since it was moved as much as it can go mechanically. After the alarm, it is recommended to perform zero return (ZRN).
(A soft limit alarm may goes off before the over-travel alarm, which is aimed at preventive set up against mechanical collision. Thus, if you move the axis in the opposite direction, the alarm will stop.)
3. If you removed the tools from the spindle using COLLET UNCLAMP, you must push the "To MANU" button to notice the machine that you removed the tool arbitrarily.



<Fig. 9>

◆ How to respond to tool damage during processing

1. The STOP button in the screen is pushed to stop the program.
2. If the spindle is rotated even after pushing the STOP button, push the SPINDLE OFF button in the MENU mode to stop the spindle rotation.
3. The JOG mode is pushed to move to the safe position (the Z axis is moved first).
4. Hold the damaged tool (to prevent a fall of the tool) and push the collet UNCLAMP button to remove the tool.

5. Insert the tool to be replaced into the place of the damaged tool number.
6. Push the "To Manu" button to inform the machine that there is no tool in the spindle.
7. A program for processing is selected and the START button is pushed to process.
- ※ If the program is terminated urgently using the ENG/RESET button, start the program after ZRN (zero return).

5. Automatic operation (AUTO)

A program (*.nc) for processing is selected and START button is pushed for processing.

◆ Checklist before the START button is pushed in the automatic operation mode

1. Check whether a correct program is loaded for the product.
2. Check whether a jig is suitable for the program and mounted with preset material.
3. Check whether tools appropriate for the program are inserted to the tool magazine.
4. Check the tool No. in the screen and the tool No. in the spindle (If no tool is in the spindle, the tool No. should be 0 and if No. 2 tool is mounted in the spindle, the tool No. should be 2.)
5. Check whether warming-up is done sufficiently.
6. Check whether ZRN (zero return) X, Y, Z, and A lamps are lit.
7. Check whether the air pressure maintains the proper pressure between 5.5 and 6.0MPa (Alarm message is displayed if the air pressure is too low.)
8. Check ENG/RESET (No flash light is normal).
9. Check whether the material is fasten well with appropriate force.



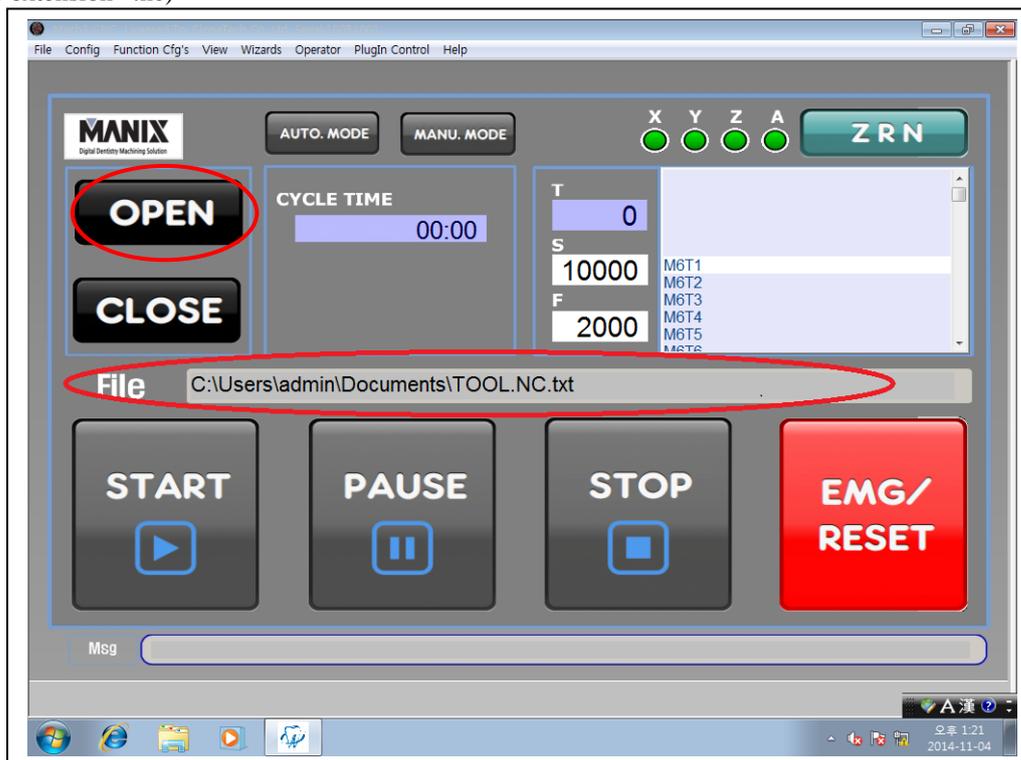
<Fig. 10>

- ◆ Precaution - IF STOP button is pushed to stop the operation during processing, the program should be modified to reprocess.

(If re-start is done with pushing the START button, it runs without the spindle rotation so that it can collide against the index or material.)

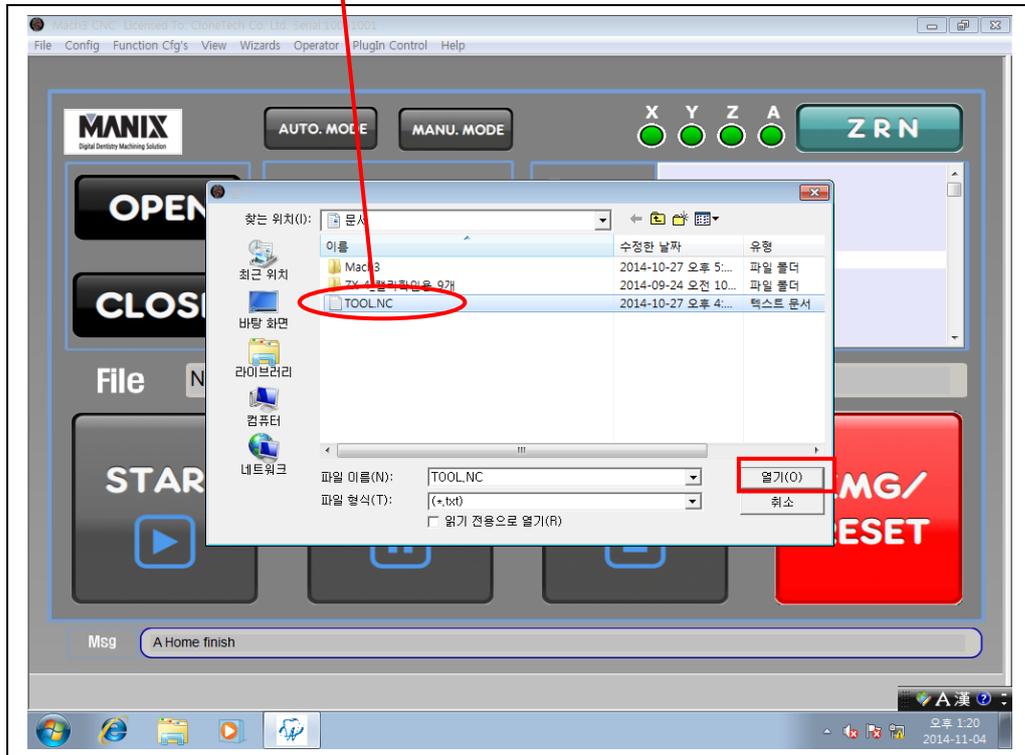
5.1 Importing the processing data

Main screen-> OPEN -> Program selection -> Open after selecting the program to be worked on
(file extension *.nc)



<Fig. 11>

Open after selecting the program to be worked on

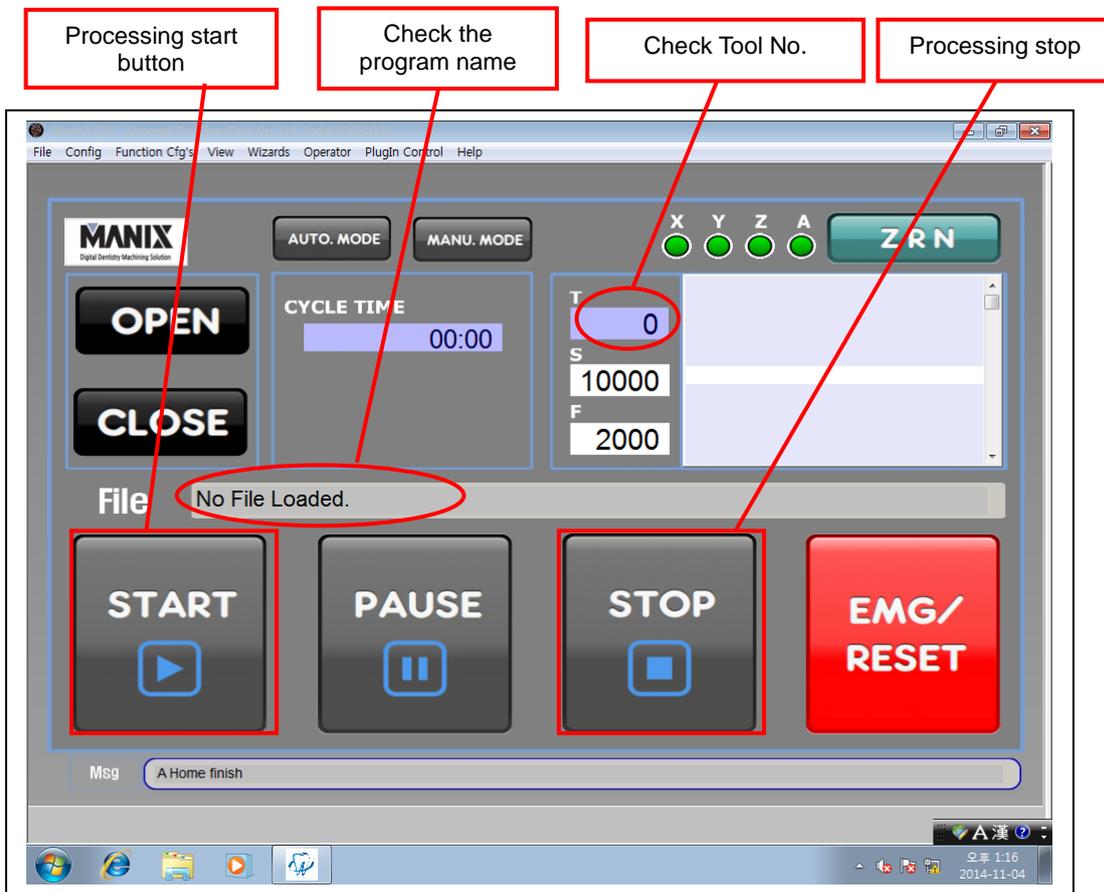


<Fig. 12>

5.2 Processing start and stop

The START button is pushed to start processing.

The STOP button is pushed to pause the processing.



<Fig. 13>

◆ Additional explanation

Coolant plays an important role in cooling action for the tools and tool's life increase.

Thus, if a coolant is not well supplied to tools or materials during processing, check the coolant amount in the coolant bottle.

Even if the coolant is filled up sufficiently in the bottle and still experiences weak coolant flow, it is likely that foreign materials block the coolant piping.

Chapter 5 Maintenance and management

1. ATC system

1.1 Overview

It is a device that exchanges the tools automatically for the improvement on operation convenience.

This device selects a required tool from the tool magazine and replaces the existing tool automatically.

1.2 ATC operation order

◆ If the tool number of the controller is 0 and the tool to be changed is No. 1

Zero return in order of Z, X, Y, and A -> Fed to No. 1 tool position -> Z-axis rapid feed

Z spindle collet unclamp -> Slowly fed up to Z-axis clamp position -> Spindle collet clamp

-> Z-axis rapid feed -> Fed to the sensor position -> Z-axis sensing

◆ If the tool number of the controller is 2 and the tool to be changed is No. 1

Zero return in order of Z, X, Y, and A -> Fed to the sensor position -> Z-axis sensing

-> Fed to No. 2 tool position -> Z-axis rapid feed -> Z-axis spindle collet unclamp

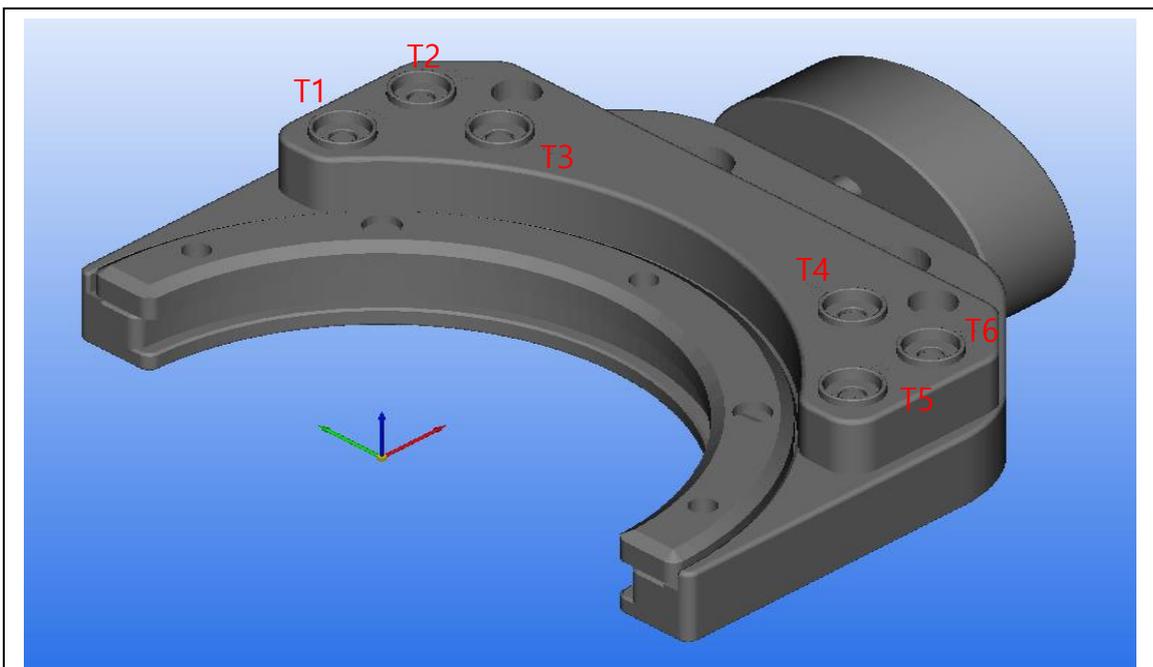
-> Slowly fed up to Z-axis clamp position -> Spindle collet clamp -> Z-axis rapid feed

-> Fed to the sensor position -> Check whether tool is removed correctly -> Z-axis rapid feed

-> Fed to No. 1 tool position -> Z-axis rapid feed -> Z-axis spindle collet unclamp ->

-> Slowly fed up to Z-axis clamp position -> Spindle collet clamp -> Z-axis rapid feed

-> Fed to the sensor position -> Z-axis sensing



2. Pneumatic systems

2.1 Overview

The pneumatic system consists of regulators, lubricators, air solenoid valve, and piping components.

(1) Compressed air is introduced through the pipe.

(2) The introduced compressive air is adjusted to proper pressure for the equipment via the regulator.

(3) The adjusted compressive air is sent to the air solenoid valve to run the air systems.

2.2 Use places of air

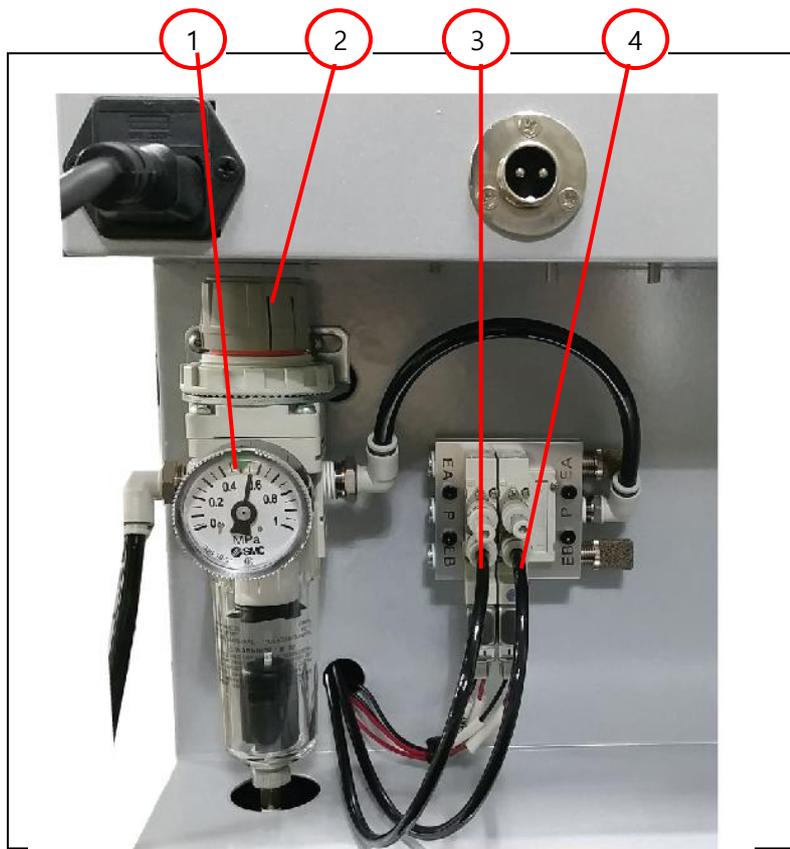
For the ATC sensor (ON, OFF)

Spindle collet (Clamp, Unclamp)

2.3 Adjustment of the air pressure

The supplied air pressure control can be done at the pressure control valve located at the upper end of the regulator.

Once the pressure control valve is pulled upward and turned in the clockwise direction, it will increase the pressure. On the other hand, if the valve is turned in the counter-clockwise direction, it will decrease the pressure. Air pressure indicated in the pressure gauge is adjusted to be 5.5 to 6 MPa.



1. Regulator (filter type)
2. Pressure control valve
3. Spindle collet AIR
4. ATC sensor AIR

<Fig. 11>

3. Coolant system

3.1 Overview

A coolant is used for cooling and lubrication of cutting points.

A coolant sucked from the coolant tank into the coolant pump is discharged to the tool and work pieces from the spindle side through the pipes. The applied coolant is returned back to the coolant tank.

3.2 Coolant

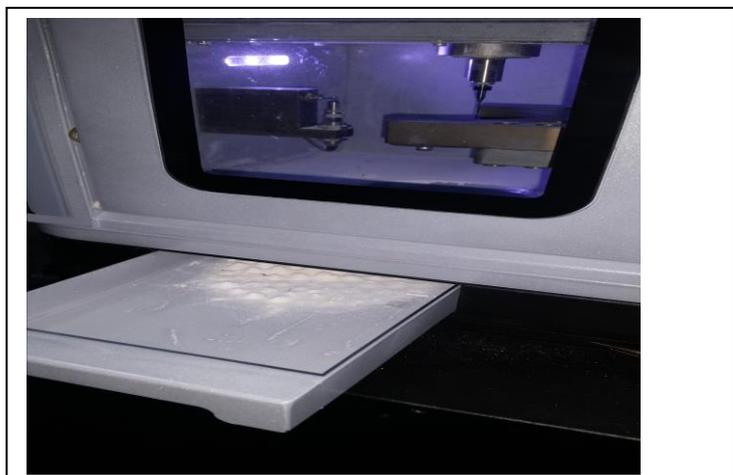
- (1) A ratio of water and soluble oil should be within a range of 15:1 – 20:1.
- (2) Water is put into a separate container first followed by adding soluble oil to make a coolant. The coolant is then put into the coolant tank.
- (3) If only water is used as a coolant without using soluble oil, serious problems can occur in the equipment due to rust.
- (4) At the start and end of every day work, a coolant remained at the lower end of the spindle and jig as well as ATC unit should be wiped out and cleansed.
- (5) If the equipment is planned not to run for a long time, a coolant in the coolant receiving portion, jig, ATC cover unit, and the lower end of the spindle should be wiped out and cleansed.
- (6) Since a coolant is alkaline, it has a strong degreasing property.
It may cause skin diseases so you need to have thorough sanitary management.
- (7) The control of coolant discharge flow rate can be adjusted via the valve in the coolant bottle.

3.3 Cleaning of the coolant tank

If fine chips (zirconia powder, ceramic powder etc.) are accumulated inside the coolant tank, a coolant may not be discharged with a proper flow rate despite of normal oil level.

If the coolant pump pumps the coolant with such large amount of fine chips, it shortens the life of the equipment.

The tank should be cleaned about once a six month.



4. Daily and periodic check-up

4.1 Overview

An operator should understand the functions and performance of the machine sufficiently and be familiar with how to use in order to operate the machine correctly with the highest performance and functions.

In addition, daily inspection should be conducted based on the daily inspection checklist in this chapter.

4.2 Checklist of the daily and periodic check-up

ZX4W daily inspection items

<Table 1>

Inspection area	Inspection item	Inspection time		Period	Inspection method	Inspection criteria	Action
		While operating	No operation				
1. Air unit	Check the moisture discharge at the regulator		O	Daily	Visual inspection	Check the proper amount	Cleansing
	Air pressure	O		Daily	Visual inspection	5.5MPa~6.0MPa	Adjustment
2. Spindle motor	Noise and vibration	O		Weekly	Check while running the machine	No noticeable problems during running	Repair
3. Spindle collet	Collet wear	O		Monthly	Making defective product due to the tool being pushed away	Abnormal product dimension	Replacement
4. Tool magazine collet	Collet wear	O		Monthly	Tool is fallen into the tool magazine.	Abnormal tool exchange	Replacement
5. Tool ring position	Ring position		O	Daily	Check the position visually prior to the tool mounting.	Check the dimension.	Adjustment
6. In the middle of tool exchange	Exchange of the tool	O		Daily	Check the exchange after tool mounting.	Operation should be run normally after exchange.	Correction
7. Cutting water nozzle	Cutting water injection position	O		Daily	Visual inspection	Check the proper amount	Cleansing
8. Inspection after the use	Processing chip cleansing		O	Daily	Check the table surrounding visually.	Check the proper amount	Cleansing
	Check the leakage of mixed cutting water.		O	Daily	Visual inspection	Unnecessary partial leakage should be none.	Repair
9. Cutting water circulation device	Check the mixed cutting water level.		O	Monthly	Cutting water flow is weak.	Check the proper amount	Supplementing
10. XYZ axes LM guide	Noise and vibration		O	Yearly	Check during machine running	Inquiry to manufacturer	

It is programmed to have a proper warming up time under no load condition prior to operation and movements at every axis and spindle bearing rotations should be running smoothly.

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Chapter 6 Response to the alarm occurrence

A type of alarms and how to respond to them

Explanation and cause of the alarm	Response
<p>* OVER TRAVEL of each axis-> It is caused when limit switch installed at the machine stroke limit is touched. e.g.) X Axis - OVER TRAVEL Y Axis + OVER TRAVEL</p>	<p>At the JOG mode, move the axis in the opposite direction to the previous moving direction. Then, alarm will stop automatically.</p>
<p>* Out of the soft limit of each axis -> e.g.) No. 1 axis is out of the soft limit zone. (X-axis No. 1 axis, Y-axis No. 2 axis, Z-axis No. 3 axis, A-axis No. 4 axis)</p>	<p>At the JOG mode, move the axis in the opposite direction to the previous moving direction. Then, alarm will stop automatically.</p>
<p>* When the equipment is stopped during processing -> 1. This can be caused when data exchange is not done properly between PC controller and machine. 2. This can be caused when the USB device is pulled out while data reading. 3. Main air is spent too much momentarily followed by deficient air amount in the equipment temporarily, causing alarm going off and equipment stopped.</p>	<p>1. Check whether power is connected to the ground. 2. Check whether PC controller contains computer virus. 3. Check the cable connector. 4. Check whether USB is correctly connected. 5. Check whether compressor air is supplied stably.</p>
<p>* Collision of the equipment during the processing -> 1. Processing is conducted with the excessive load more than allowable load. 2. Alarm goes off when transfer is stopped due to mechanical collision.</p>	<p>1. A friction force increases due to the tool friction causing alarm going off due to excessive friction more than the allowable friction. -> Replace the tool. 2. If the collision to the equipment occurs, contact the main office immediately.</p>
<p>* When EMG/RESET button is not released and continue flashing, 1. It occurs when mechanical feed at each axis is deviated from the allowable value. 2. When the equipment is stopped due to collision and impact during processing,</p>	<p>Manix program is terminated (During termination process, all pop-up windows should be YES) -> The machine power is OFF -> Wait for three sec. -> The machine power is ON -> The Manix program is ON ->EMG/RESET is released -> Manix logo is clicked to enter into MENU. -> At JOG mode, Z+ moves and check the safety (*collision warning*) and move each axis slowly. -> After ZRN, start processing.</p>
<p>* During tool change, a tool hanged over the spindle is fallen while performing tool change -> 1. When tool No. in the screen is 0 and tool change is done, such behavior occurs.</p>	<p>When tool No. in the screen is 0 a tool clamped in the spindle is released via manual mode and inserted into the tool magazine.</p>
<p>* External EStop Requested 1. Servo driver (inside the machine) may have a problem.</p>	<p>It could be hardware problems so contact the purchaser.</p>
<p>* During the program(CSCAM) running, when Fail IPO is highlighted with red color,</p>	<p>the backup folder is pasted into the currently running folder.</p>
<p>* During the program(CSCAM) running, NC Card Isn't detected! is highlighted with red.</p>	<p>Controller NC card is damaged. Need to replace. (For replacement, the manufacturer should be contacted)</p>
<p>* F_82012 syntax error.</p>	<p>When processing data is extracted, check whether template setup is set to ones of other companies.</p>

Explanation and cause of the alarm	Response
* The processing object is not positioned correctly	It may be caused by the damage of the setup data. Therefore, backup folder is pasted into the place where current program is running.
* Tool is not gripped properly	Tool may not be placed vertically. Check whether tool is put into the inside of the tool box. When gripping with a little force -> a tool sensor may be damaged.
Others	Other problems other than above issues should contact the manufacturer.

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