

**CNC LATHE MACHINE**

**FANUC 0i-TF SERIES**

# **Operation Manual**

Proper operations and periodical maintenance are essential for the safe use of this machine. Do not operate or maintain the machine before you have read the following manuals, and have familiarized yourself thoroughly with their content.

Do not operate or handle the machine in any way which is not described in these manuals. And take great care of the contents designated by "**DANGER**", "**WARNING**", "**CAUTION**", and "**NOTE**" in these manuals when operating and maintaining the machine. If you don't follow these instructions, it may result in serious damage to the operators and / or machine. Be sure to perform the operation and maintenance in accordance with the instructions in the manuals.

However, since there are so many operations which cannot or should not be performed, it is impossible to include all of these in the manuals. Therefore the operations which are not described in the manuals should be regarded to be impossible. We shall not accept responsibility for accidents resulting from operations or handling which are not described in the manuals.

In this operation manual, the matters, which if not followed may result in an accident resulting in injury or death, are specified as **DANGER** or **WARNING**. And the matters, that if not followed may result in damage to and / or failure of the machine and / or equipment, are specified as **CAUTION**.

Enclosed each kind of book :

1. OPERATION MANUAL (Contain Circuit diagram)
2. CNC CONTROLER OPERATION MANUAL AND PROGRAMMING MANUAL

Product Date : \_\_\_\_\_  
Machine Type : \_\_\_\_\_  
Machine Number : \_\_\_\_\_

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### (1).Observe the safety rules in the workshop.

- 1.The machine should be operated by only one operator who has received training approved by our agent. If another person presses the operation switches or push button switches to operate the machine while the operator is exchanging the fixtures, chuck or tools, or repairing the machine, etc.,there is a high chance that a fatal accident may occur. When it is necessary for two or more people to work, take great care about the safety, for example, by making signals to each other.Obey the instructions, working procedures, and the rules which describe
- 2.what is prohibited in the workshop.
- 3.When two or more people perform the task at a time, have them work in accordance with the specified signals.

### (2).Provide the safety equipment

- 1.Be sure to securely fix the guards and covers to the specified places.If they are damaged, repair them immediately.
- 2.Thoroughly understand how to use the safety devices and use them correctly. If they are operated improperly, it may cause a serious injury.

### (3).Wear safety clothes and protective devices.

- 1.Do not operate or handle the machine when wearing loosen wears accessories. Especially, it is likely to be caught by the machine.
- 2.Be sure to wear helmets, safety goggles, safety shoes, masks, gloves according to the task. Never fail to wear the protective devices such as helmets, safety goggles, and gloves especially when there is a risk of metal chips, foreign matters, etc. being thrown from the machine.
- 3.PROTECT your eyes. Wear safety glasses with side shields at all time.
- 4.DON'T get caught in moving parts. Remove watches, rings, jewelery,neckties and loosen fitting clothes.
- 5.PROTECT your head. Wear safety helmet when working near overhead hazards.
- 6.PROTECT your feet. Always wear safety shoes with steel toes and oil resistant soles.
7. Gloves are easily caught in moving parts. TAKE THEM OFF before you turn on the machine

(4). Do not tamper with the machine.

1.Never modify or alter the machine without OUR permission. We shall not accept responsibility for unapproved modifications or alternations, or accidents resulting from them.

(5). Perform the operations with both hands.

1.Perform all the operations with both hands except for those which are described in the manual as only being able to be performed with one hand.

(6). Never do the following during operation.

1.Never approach the movable parts during operation.  
2.Never open the doors of the machine during operation.  
3.Never touch the operation switches and push button switches indiscriminately during operation. Never lean against the machine or rest your hands or legs on the machine carelessly. There is a high risk that the machine will move unexpectedly.

(7). Carefully, read the manuals for each equipment.

1.DON'T run your machine until you have read and understood the Operation, Programming and Maintenance manuals.  
2.DON'T run your machine until you have read and understood all the machine and control key signs.  
3.DON'T run your machine for the first time without a qualified instructor. ASK your supervisor for help when you need it.

(8). Carefully, read the manuals for each equipment.

- 1.Keep fire away from hydraulic oil, lubricant, and cutting liquid. There is a risk of ignition.
- 2.Never take lighted cigarettes or matches, etc near the machine.
- 3.Store inflammables in a safe place where there is nothing to start a fire. Check the storage and using method of the fire extinguisher in case of an emergency.
- 4.Be sure to dispose of cloth containing oil. If it is not disposed of properly, it may spontaneously ignite.
- 5.Wipe away any spilled oil immediately.
- 6.PREVENT fire. Keep flammable liquids and materials away from the work area and from hot chips.

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#### **(9).Application of oily cutting fluid and unmanned operation of machine.**

This part which is not incombustible, fire-resistant, is used for the part of this machine. There is possibility to fire according to the material to be cut, cutting fluid, swarf, the machining condition, the collision of the machine by the unexpected accident. Fully pay attention to the following items.

- 1.Oily cutting fluid has danger to cause a fire due to its flammability.
- 2.Avoid executing the unmanned operation of the machine with oily cutting fluid applied.
- 3.When operating a machine with oily cutting fluid applied, the operator must always watches over the machine and must confirm that cutting fluid is properly jetted out for the machining point or the cutting blade of the tool.
- 4.When it is necessary to execute the unmanned operation of the machine with oily cutting fluid applied, prepare the equipment such as automatic fire extinguishing system beforehand at customer side in case the fire should occur. (anti-oil type)

#### **(10). Provide fire extinguishers and first-aid kits.**

Prepare fire extinguishers and first-aid kits and write down the address and phone number of the place to be contacted in an emergency.

- 1.Install a fire extinguisher, and understand how to use it.
- 2.Decide where first-aid kits are to be placed, and always keep it there.
- 3.Decide what to do and who to contact in the case of a fire or accident, and write down the phone number of the place to be contacted.

#### **(11). Provide fire extinguishers and first-aid kits.**

- 1.KEEP your hair away from moving parts.
- 2.Loosen objects can become flying projectiles. REMOVE all loosen items (wrenches, chuck key, rags etc.) from the machine before starting.
- 3.NEVER operate a machine tool after taking strong medication, using non-prescription drugs, prescription drugs or consume alcohol which may impair concentration.
- 4.NEVER attempt to run or operate the machine with the splash guard door open. ALWAYS make sure the working and cutting zone is safeguarded.
- 5.PROTECT your hands. Make sure the spindle is stopped before manually changing the tool.
- 6.PROTECT your hands. Make sure the spindle is stopped before manually changing the workpiece.
- 7.PROTECT your hands. Make sure the spindle is stopped before manually clear away chips or oil. Use a brush or chip scraper. NEVER use your hands.

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(11). Provide fire extinguishers and first-aid kits.
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- 8.PROTECT your hands. Make sure the spindle is stopped before manually adjusting the workpiece, fixture, chucks or coolant nozzles.
- 9.PROTECT your hands. Make sure the spindle is stopped before you take measurements.
- 10.PROTECT your hands. Make sure the spindle is stopped before you move a safeguard. Never reach around a safeguard.
- 11.PROTECT your hands. Make sure the machine is switched off and electrically isolated before making any mechanical adjustment to the machine.
- 12.PROTECT your hands. Beware the sharp edges of cutting tools when changing and / or handling tooling.
- 13.PROTECT your eyes and the machine. Never use a compressed air hose to remove chips.
- 14.KEEP the work area well lighted. Ask for additional light if needed.
- 15.DON'T get trapped. Avoid pinch points caused between other machines and the machine you are working.
- 16.NEVER lean on your machine. Stand away when the machine is running.
- 17.PREVENT slip. Keep your work area clear and dry. Remove chips, oil and obstacles.
- 18.PREVENT objects from flying loosen. Surely clamp and locate the workpiece. Use fixtures where possible. Use stop blocks where necessary clamps clear of the cutter path.
- 19.PREVENT the machine from moving unexpectedly. Never leave the machine in the MPG (manual pulse generator) mode. Accidental rotation will move a machine axis.
- 20.PREVENT the machine from moving unexpectedly. When leaving the machine unattended, not producing components, leave MODE switch in MANUAL mode

(12). Provide fire extinguishers and first-aid kits.

- 1.PREVENT cutter breakage. Use correct cutter speed and axis feedrate for the job. Make manual override adjustment of axis feedrate or spindle speed if you notice unusual noise or vibration. Ask your supervisor for help if you need it.
- 2.PREVENT cutter breakage. Use the correct tools for the job and the spindle rotation direction.
- 3.PREVENT workpiece and cutting tool damage. Never start the machine when the cutting tool is in contact with the workpiece.

(12). Provide fire extinguishers and first-aid kits.

4. Dull and damaged tools break easily. Inspect tools and tool holders. Keep tools sharp. Keep tool overhang short.
5. Keep all lubrication reservoirs maintained at the correct level. Always keep to the maintenance schedule.
6. Certain materials, such as magnesium, are highly flammable in dust and chip form. See your supervisor before working with these materials.
7. DO NOT use the machine in a volatile atmosphere. Electrical devices fitted to this machine are for normal factory use, and are not explosion-proof.
8. Always keep the machine clean and do not let chips collect. Never remove fixed guards to clean the machine.
9. This machine tool is a MACHINING CENTER, and is intended for use in machining materials with the workpiece fixed to the table, and the cutting tool rotating in the spindle. The machine should not be used for any other purpose.

### **(13). Residual risks**

This machine tool has been designed and manufactured to the highest standards, but still your attention is drawn to the following RESIDUAL RISKS existing within the machine.

1. There is at all times hand and finger access to the chain of the chip conveyor, both from within the machine and the chip exit point. Never attempt to clear chips from these areas without stopping and turning off the machine. The chain can unexpectedly start-up from a program command.
2. There is at all times hand and finger access to the belt of the transmission system (such as axis, spindle, position coder), both from within the motor and the shaft pulleys point. Never attempt to servicing these areas without stopping and turning off the machine. The belt can unexpectedly start-up from a program command.



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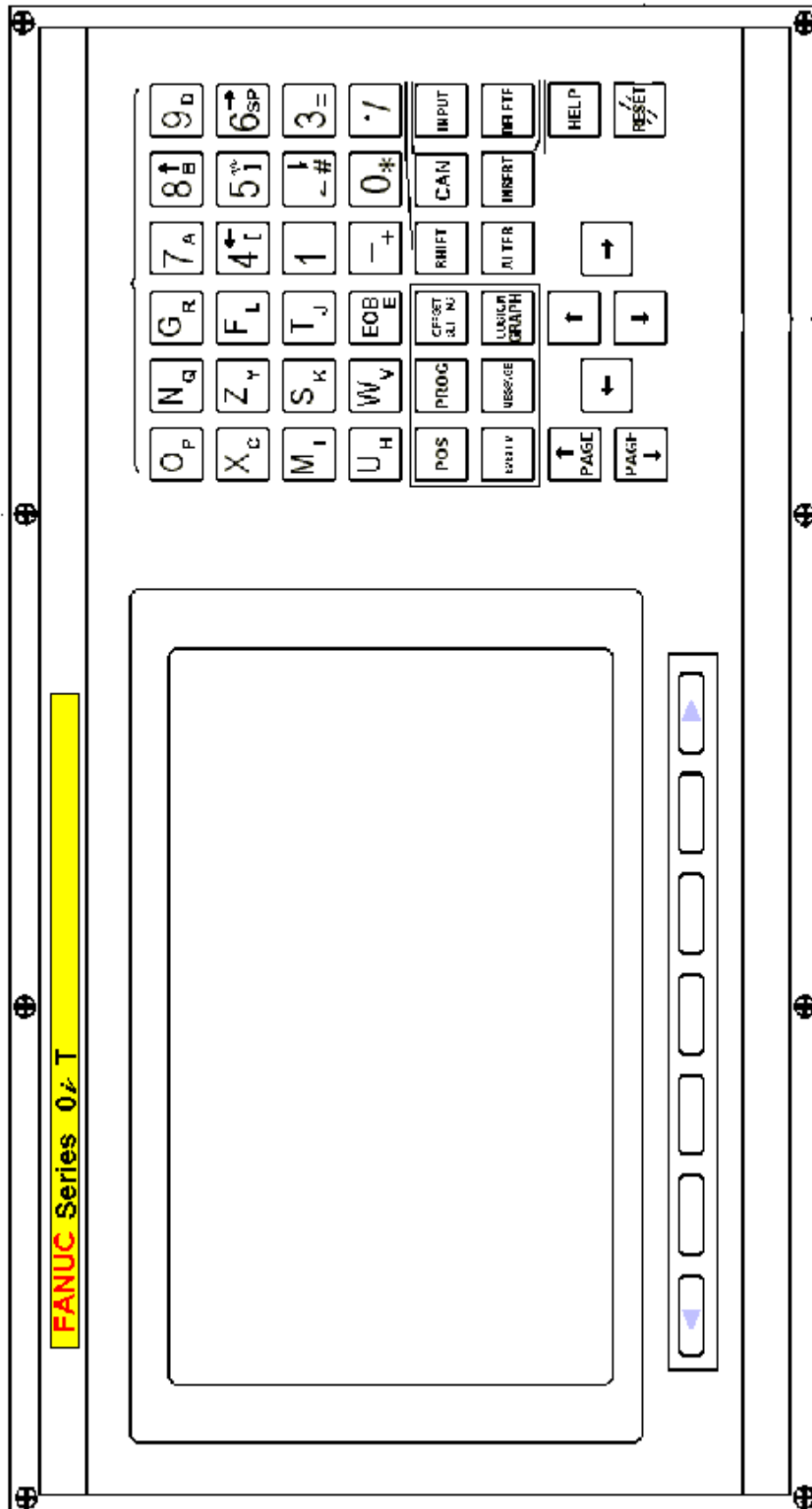
# CHAPTER 2

## OPERATION PANEL DESCRIPTION

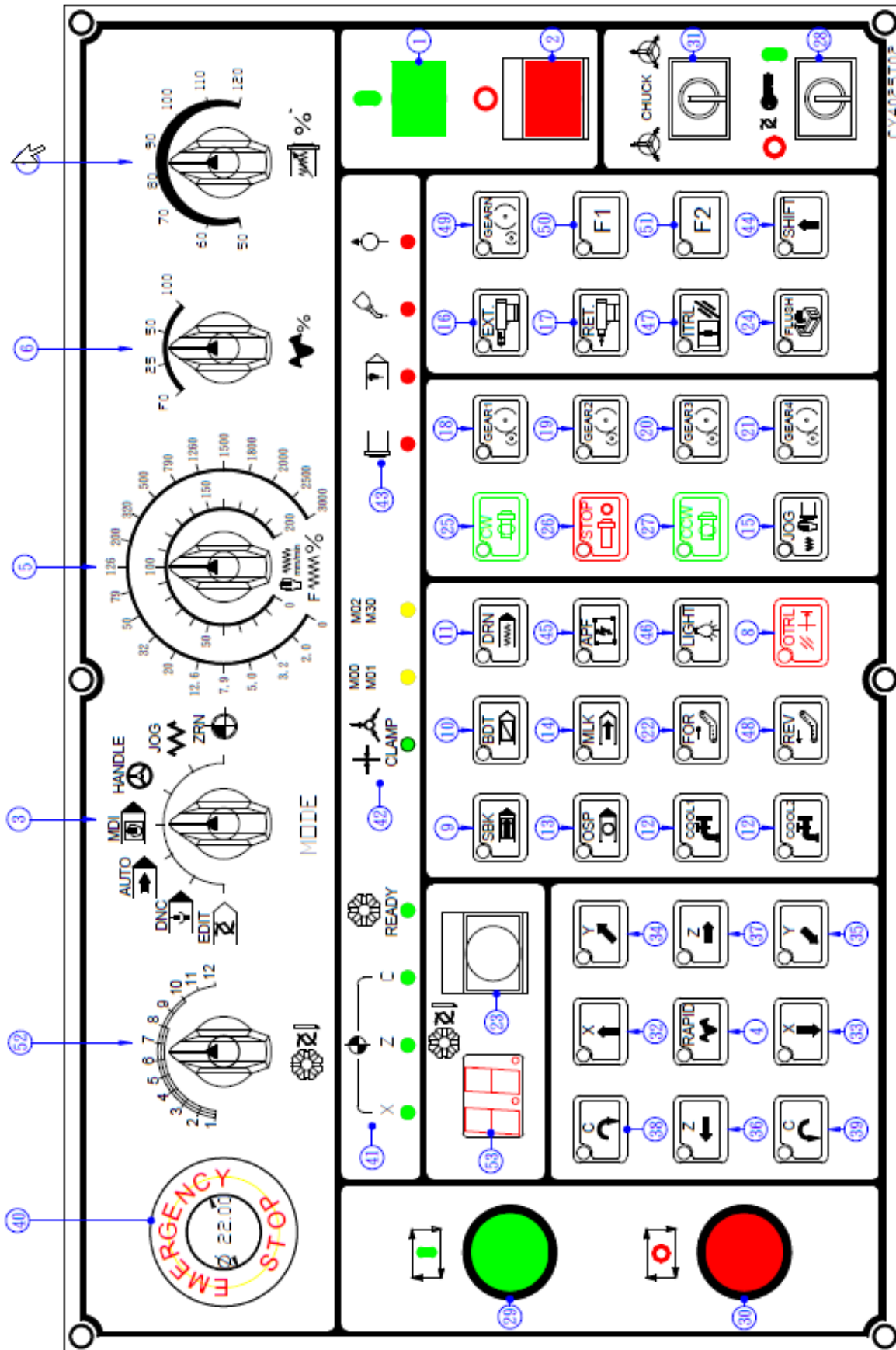
Product Date : \_\_\_\_\_  
Product Numbers : \_\_\_\_\_  
Program Number : \_\_\_\_\_  
Machine Type : \_\_\_\_\_  
Machine Number : \_\_\_\_\_

## 2. PANEL FUNCTION DESCRIBE

## 2.1 FANUC 0ITD MDI/EDIT 8.4" LCD PANEL



2.2 OPERATER' S PANEL

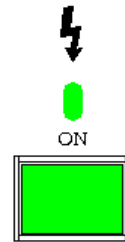


## 2.2.1FUNCTION OF OPERATER PANEL

### (1) POWER SWITCH ----ON (POWER ON)

To press this button and the NC power on.

Don't press this button also press any key of MDI/EDIT panel.



### (2) POWER SWITCH----OFF (POWER OFF)

After pushing down “EMERGENCY STOP” button ,  
press “OFF” button to power off NC control power.



### (3) MODE SELECTOR SWITCH : (left to right form forward direction)

EDIT : Program edit mode

TAPE : Tape mode (RS232 communication from PC)

AUTO : Auto program executing mode

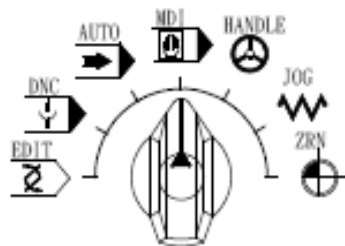
MDI : Manual data input mode . Executing single block command inputting data  
& machine parameters can be used with this mode.

HANDLE : Hand wheel (MPG) operating mode . NC control is just been operated  
with MPG on HANDLE mode . Each grid of scale is 0.001 , 0.01 , 0.1  
mm with metric unit or 0.0001 , 0.001 , 0.01 inch with inch unit .

JOG : Manual mode . Axes movement can be manual operating .

ZERO : Machine origin point return mode . When mode selector on ZERO  
RETURN mode , press “Z+” 、” Y+” 、” X- “ direction key for each axis .  
The machine return to search origin point according on rapid speed . Adjusted  
rapid speed via “Percent switch of rapid speed” . The machine will slow down  
axes automatic when axis is closed origin point until LED of each axis be lighten .  
It means ZERO RETURN of each axis is finished.

P.S When the front door check function on,and the door be opened,  
the RAPID function is invalid.



### (4) RAPID MODE : Function of rapid mode should be switch to JOG mode .

the use this switch, the rapid of axes be operated by [axes select switch](32~37).

The feedrate of axes be controlled by [ feedrate adjust switch](6).

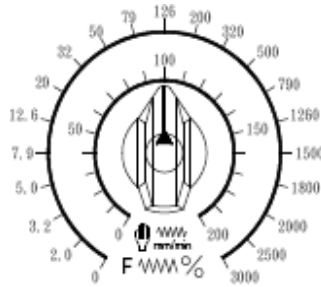
PS. When the front door close check function on, and the door be opened, this switch can started  
the spindle run by 50RPM.



- (5) FEEDRATE SWITCH :Adjust switch percent for feed speed from 0% to 150% when executing command of MDI 、 AUTO or TAPE mode . Increase or decrease 10% to change feedrate each grid .JOG mode can be adjusted jog speed on manual mode and program dry run (DRN) for machine on AUTO mode. The speed range is 0 to 1260mm/min  
( FEEDRATE SPECIFICATION A , PARA#11 bit 3)

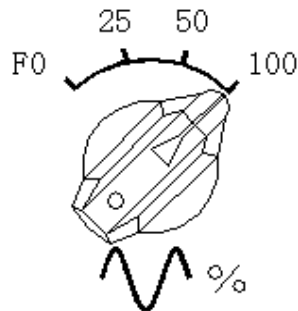
The parameter no.3108#7(JSP) set = 1, the value of low feedrate can be displayed on the[POS] and [CHECK].

The parameter no.1401#4(RF0) set=1,then this switch be changed to the 0 position, the program is executed the G00, the machine be stopped to move.



- (6) Percent switch of rapid speed:

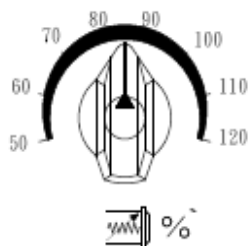
Active on rapid 、 ZERO RETURN mode & G00 on AUTO mode . Rapid speed can be adjusted from the switch , the range is LOW (set from machine parameter) 、 25 、 50 、 100%.



RAPID SPEED	HANDLE SPEED
F0	×1
25%	×10
50%	×100
100%	×100

- (7) Percent switch of spindle speed:

Spindle rotating speed can be adjusted form 50 to 120% , Increase or decrease 10% to adjust speed each grid .



- (8) OVERTRAVEL RELEASE SWITCH :

If machine is over each axis travel to overtravel limit switch , keep to press this switch “ON” , then move machine to travel range with converse direction on

manual mode (JOG 、 HANDLE mode ) . After that , execute axes ZERO RETURN on ZERO mode .





**(9) SINGLE BLOCK SWITCH :**

When the switch is “ON” on AUTO mode , program is able to execute with single block .  
Operator should press “CYCLE START ” switch to execute next program block



**(10) BLOCK IGNORE SWITCH :**

When the switch is “ON” on AUTO mode , machine will ignore single command block with “/” command . “OFF” is normal status .



**(11) DRY RUN SWITCH :**

Feedrate SW5(0~150%) will be invalid and use Slow Speed Shift Control instead when the program execute an interpolation commands(G01,G02,G03...etc.) and this switch is ON.

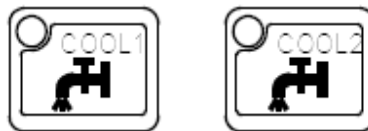
To set the parameter 1401#6(RDR) if the switch is valid for G00 command.



**(12) COOLANT SWITCH: valid for JOG and AUTO mode**

Coolant is ON when pressing the SWITCH at any modes.After you press it again,Coolant will be OFF.

When the program at AutoRun executes till M08,Coolant will be ON. When it executes till M09,Coolant will be OFF(or press SWITCH to be OFF as well);If the program execute M00 or M01(reference to OSP SWITCH)during cooling,Coolant will be OFF temporarily and it will be back to ON after pressing CYCLE START SWITCH.



**(13) OPTIONAL STOP SWITCH : (Used on AUTO mode)**

When the switch is “ON” and program block with M01 , machine will pause program .  
The function is similar M00 . If the switch is “OFF” , M01 is ineffective .



**(14) MACHINE LOCK SWITCH :**

When the switch is "ON", machine stop axes but it still run G、M、S and T code function. After the function, machine should be ZERO RETURN.



**(15) SPINDLE JOG SWITCH:**

When the spindle be stopped at manual mode, press this switch, then the selected spindle be run by 50rpm at any gear; release this switch, then the spindle be stopped immediately.

PS. When the spindle cutting is unclamped, the spindle can't be started by this switch.



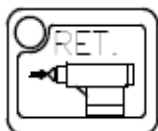
**(16) QUILL EXTEND SWITCH :**

The spindle be stopped or the chuck be clamped at manual mode, press this switch then release, the quill will be stopped after extending a little bit. It called the quill jog operating. The switch continuous being pressed over 0.5s and the quill keep extending. The spindle be stopped at auto mode and the quill continuous being extended by M33.



**(17) QUILL RETRACT SWITCH :**

To operate the quill retracting at manual mode. Please refer to the manual operating of quill extend function. the spindle be run at auto mode and the quill can be retracted by M34.



**(18) GEAR 1 TURNING SPINDLE LOW GEAR SWITCH:**

To press this switch at manual mode and the gear of spindle be changed to gear 1 then the spindle be stopped. The gear of spindle can be changed to gear 1 by M41. The range low gear rate of spindle is 6~38rpm.



**(19) GEAR 2 TURNING SPINDLE MIDDLE-LOW GEAR SWITCH:**

To press this switch at manual mode and the gear of spindle be changed to gear 1 then the spindle be stopped. The gear of spindle can be changed to gear 2 by M42. The range gear 2 rate of spindle is 25~123rpm.



(20) GEAR 3 TURNING SPINDLE MIDDLE-HIGH GEAR SWITCH:

To press this switch at manual mode and the gear of spindle be changed to gear 3 then the spindle be stopped. The gear of spindle can be changed to gear 3 by M43. The range gear 3 rate of spindle is 85~460rpm.



(21) GEAR 4 TURNING SPINDLE HIGH GEAR SWITCH:

To press this switch at manual mode and the gear of spindle be changed to gear 4 then the spindle be stopped. The gear of spindle can be changed to gear 4 by M44. The range gear 4 rate of spindle is 250~650rpm.



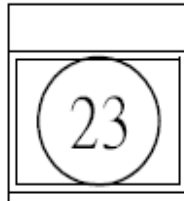
(22) CHIP CONVEYOR FORWARD SWITCH : (OPTION)

When the switch is "ON" , chip conveyor start movement with forward direction . Switch "OFF" to stop .



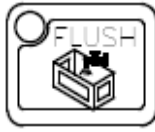
(23) TURRET CW SWITCH:

If the switch [T CCW] of SOFT OPERATION PANEL is OFF and then press the switch,the turret will start to run by a clockwise series of numbers(1 、 2 • • • 8).Oppositely,if it is ON and then press the switch,the turret will start to run by a anticlockwise series of numbers(8 、 7 • • • 1). In Auto mode,the turret is started running by the command T and the rotation path is by the shortest one.



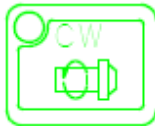
**(24) CHIP COOLANT SWITCH :**

When the switch is “ON” , chip coolant be started. Switch “OFF” to stop .

**(25) SPINDLE CW SWITCH : (Used on manual mode )**

Before the switch “ON” , user should execute “S” command first on MDI or AUTO mode . Then operate the switch on manual mode , spindle will rotate from forward direction . After running spindle , spindle rotating speed can be adjusted form 50 to 120% of spindle percent switch .

- PS. 1.When the spindle is unclampde,this switch can't be started the spindle run.  
2.When the front door close check function on, and the door be opened, this switch can started the spindle run by 50RPM.

**(26) SPINDLE STOP SWITCH : (Used on manual mode )**

When the switch is “ON” , spindle can stop running .

- PS. At any mode, press the [RESET] or [EMERGENCY STOP] switch can stopped the spindle be selected immediately.

**(27) SPINDLE CCW SWITCH : (Used on manual mode )**

Before the switch “ON” , user should execute “S” command first on MDI or AUTO mode . Then operate the switch on manual mode , spindle will rotate from reverse direction . After running spindle , spindle rotating speed can be adjusted form 50 to 120% of spindle percent switch .

- PS. 1.When the spindle is unclamped, this switch can't be started the spindle run.  
2.When the front door close check function on, and the door be opened, this switch can started selected immediately.

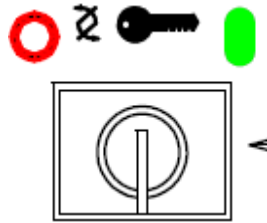
PS. 1.Turning spindle not clamp, this switch can not start spindle run.

2.When the front door close check function be used,and the door close, this switch just can be started the spindle run by 50PRM.



**(28) PROGRAM PROTECT KEY SWITCH : PROGRA EDIT 、DTAT EDIT VALID.**

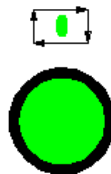
When the key switch on “OFF” (Count clock direction) , program 、tool data 、work-piece coordinate 、diagnose parameter can’ t be edited . When the key switch is “ON” (Clock direction) , those can be edited .



**(29) CYCLE START SWITCH : (Used on MDI.AUTO.TAPE mode )**

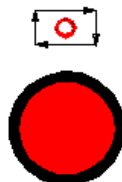
- a.)Execute MDI command:When mode selector is on MDI mode and input single block command , then press the switch to execute the command .
- b.)Execute commands of program on memory:When mode selector is on AUTO mode and select a program , then press the switch to execute the program .
- c.)Restart command of program:After pressing “CYCLE STOP” switch , NC interrupt program and machine will stop running . When press “CYCLE START” switch again , it’ s able to continue unfinished commands of program .
- d.)Execute commands of program from TAPE:When mode selector is on TAPE mode , then press the switch than can execute program form external devices (Tape 、PC , etc···)

P.S. When the cutting spindle unclamp or the front door be opened, this switch can't to be started the spindle run.

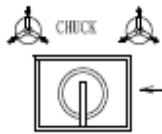


**(30) CYCLE STOP SWITCH :(Used on MDI.AUTO.TAPE mode )**

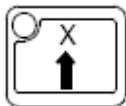
If NC is executing commands of program , press the switch to make axes pause . The lamp of switch is lighted , but spindle is still running .



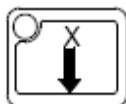
- (31) Chuck inside 、outside select key switch : manual model valid 。  
 switch change to anticlockwise 、select turning spindle oil chuck is outside and  
 (use oil chuck valid) switch change to clockwise 、select turning spindle oil chuck  
 is inside. after switch change , please adjust oil chuck turnround oil pressure  
 clamp or unclamp position. When chuck inside 、outside clamp select finish vat 2  
 sensor .Allow CNC can correct detect chuck ,please foot switch(2.4 (1)).  
 When chuck not clamp and turning spindle can not runuprrot key (two-way both ).  
 Chuck clamp or unclamp control by program not auto execute .  
 Operate auto model , first m31 instruction make chuck message ignore ,  
 then m10 instruction make chuck clamp or m11 instruction make chuck release.  
 then M30 instruction close chuck message ignore.



- (32) — x axis control switch : fast 、slow move and zero return model valid 。  
 A. slow move model : when model select switch(3)select jog  
 position , x axis from the back(leave operator ) and follow slow BCD  
 switch(5)setting speed move  
 B. fast move model : when model select switch(3)select jog  
 position and press rapid model switch(4) , **x axis** from the back(  
 leave operator) , and follow slow BCD switch(6)setting speed  
 move 。  
 P.S After power on axis not execute zero return , assign(X,Z,C)  
 can not execute rapid,want to execute rapid,reference parameter  
 number1401#0(rpd=1)  
 C. Zero return model : when model select switch (3)select ZRN position ,  
 when press this switch , x axis follow fast BCD switch(6)setting  
 speed move to x axis zero position,x axis zero guiding lamp(39)on  
 show zero return finish  
 use abs servo motor , restart don't execute zero return

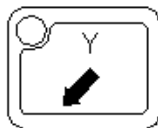


- (33) +**X AXIS CONTROL SWITCH : FAST 、SLOW MOVE MODEL VALID** 。  
 A. Slow move model : when model select switch(3)select jog  
 position , x axis from the front(near operator) and follow slow BCD  
 switch(5) setting speed move 。  
 B. Fast move model : when model select switch(3)select jog  
 position and press rapid model switch(4) , **x axis** from the front  
 (near operator) , and follow slow BCD switch(6)setting speed  
 move 。



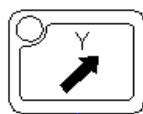
## (34) -Y AXIS CONTROL SWITCH : FAST 、 SLOW MOVE MODEL VALID

- A. Slow move model : when model select switch(3)select jog position , x axis from the front(near operator) and follow slow BCD switch(5) setting speed move .
- B. Fast move model : when model select switch(3)select jog position and press rapid model switch(4), **x axis** from the down ,and follow slow BCD switch(6)setting speed move.



## (35) +Y axis control switch : fast 、 slow move and zero return model valid .

- A. slow move model : when model select switch(3)select jog position , x axis from the back(leave operator ) and follow slow BCD switch(5)setting speed move
- B. fast move model : when model select switch(3)select jog position and press rapid model switch(4), **x axis** from the up( ,and follow slow BCD switch(6)setting speed move.
- C. Zero return model : when model select switch (3)select ZRN position , when press this switch , x axis follow fast BCD switch(6)setting speed move to x axis zero position,x axis zero guiding lamp(39)on show zero return finish  
use abs servo motor , restart don't execute zero return



## (36) —Z AXIS CONTROL SWITCH:

- A. Slow move model : when model select switch(3)select jog position , **z** axis from left move(near turning spindle) , and follow slow BCD switch(5) setting speed move .
- B. Fast move model : when model select switch(3)select jog position and press rapid model switch(4) , **z** axis from left move (near turning spindle) , follow slow BCD switch(6)setting speed move .



## (37) +Z axis control switch : fast 、 slow move and zero return model valid .

- A. slow move model : when model select switch(3)select jog position , z axis from right(near tail) , and follow slow BCD switch(5)setting speed move .
- B. Fast move model : when model select switch(3)select ZRN position and press rapid model switch(4) . Z axis from right(near tail) and follow slow BCD switch(5)setting speed move .
- C. Zero return model : model select switch(3)select ZRN position , when press this switch , z axis follow fast BCD switch(6)setting

speed move to z axis zero position,z zero guiding lamp(39)on  
show zero return finish

◦ use abs servo motor , restart don't execute zero return

restart don't execute zero return

PS. When tail change position , please execute zero return , prevent turret  
and tail intervene ◦



**(38) -C AXIS CONTROL SWITCH:**

A. Slow move model : when model select switch(3)select jog position ,  
c axis anticlockwise(to face chuck) move and follow slow BCD switch(6)setting  
speed move.

B. Zero return model : model select switch(3)select ZRN position ,  
when press this switch , c axis follow fast BCD switch(6)setting  
speed move to c axis zero position,c zero guiding lamp(39)on ,  
show zero return finish



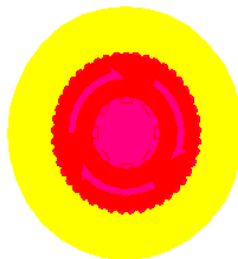
**(39) +C AXIS CONTROL SWITCH:**

A. slow move model : when model select switch(3)select jog position ,  
c axis anticlockwise (to face chuck) move and follow sloe BCD switch speed move.  
B. fast move model : when model select switch(3)select jog position and  
press rapid model switch(4) , **c axis anticlockwise(to face chuck)**move ,  
follow slow BCD switch(6)setting speed move ◦



**(40) EMERGENCY STOP BUTTON :**

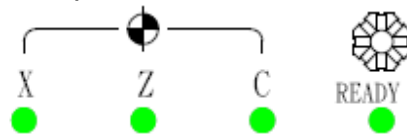
When push down the button , NC commands will be stopped , servo systems and  
other devices will be powered off . Inward knob of button rotate from  
clock direction  
that can rehabilitate .





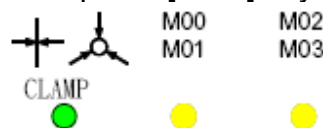
(41) AXIS ORIGIN GUIDING LAMP : LEFT TO RIGHT , ALL MODEL VALID ◦

- A. X axis rigin guiding lamp : x axis execute zero return , lamp to glisten , when arrive x axis zero position , lamp on , and keep on state .if x axis remove zero position , lamp off ◦
- B. Z axis rigin guiding lamp : z axis execute zero return , lamp to glisten , when arrive z axis zero position , lamp on , and keep on state .if z axis remove zero position , lamp off ◦
- C. C axis rigin guiding lamp : c axis execute zero return , lamp to glisten , when arrive c axis zero position , lamp on , and keep on state .if c axis remove zero position , lamp off ◦
- D. TURET PRAPARE R GUIDING LAMP : ALL MODEL VAILD ◦  
When turret change tool and clamp finish , lamp on and keep on state.  
In normal state , when lamp off , turret can not auto change tool ◦



(42) STATE GUIDING LAMP : LEFT TO RIGHT DESCRIBE

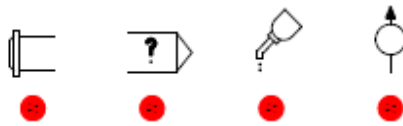
- A. chuck clamp guiding lamp : chuck clamp finish , lamp on and keep on state. spindle can be run ◦ if lamp off ,spindle can not run.
- B. M00/M01 GUIDING LAMP :  
When cnc execute m00 instruction program suspend. lamp on and keep state.  
When program suspend to relieve and lamp off. The CNC execute m01 instruction and select stop switch(13,.osp) "on" and lamp on.  
when program suspend to relieve and lamp off.  
(press[reset]key or[cycle start]switch(29) , can to relieve program suspend state)
- C. M02/M30 GUIDING LAMP : when the CNC execute m02 instruction (program end). And lamp on and keep on state. when press [reset] key or [cycle start]switch(29) and amp off. The CNC execute m30 instruction (program end &back) then the lamp on and keep on state. when press [reset] key or [cycle start]switch(29).



(43) ALARM GUIDING LAMP : (LEFT TO RIGHT DESCRIBE )

- A. SPINDLE ALARM LAMP : WHEN SPINDLE MOTOR CONTROL CIRCUIT, PARM, ENCODER OR MOTOR HAVE ALARM ,THIS TIME LMAP ON,UNTIL CLEAN ALARM STATE,LAMP OFF
- B. NC lamp : Program 、 operate error 、 axis over travel 、 NC alarm ...etc.
- C. Lube alarm lamp : Oil of lubrication low . When the lamp light , NC make commands of program to single block execution .(REFERENCE 5.2.2 PLC KEEP RELAY FUNCTION SELECT DESCRIBE AND SETING)  
RESUPPLY OIL , LAMP OFF , NC ETURN NORMAL OPERATE STATE ◦

D. PRESS.ALARM LAMP : WHEN AIR PRESSURE OR OIL PRESSURE LOW ,  
LAMP ON ; PRESSURE RETURN NORMAL , LAMP OFF



(44) SHIFT AUXILIARY FUNCTION SW

A. TO PRESS THE SHIFT FUNCTION (ON MANUAL MODE):

1.TO PRESS TURNING/MILLING CHANGE SWITCH(45), THE C AXIS AND SPINDLE BE COMBINED.

2.K15#7 SET TO 1 (ON TURUNING/MILLING MAINTAIN MODE):

(1.) TO PRESS THE GEAR 1 SW (18), THE SPINDLE GEAR BE CHANGED TO GEAR 1.

(2.) THE GEAR MUST ON GEAR 1 POSITION AND ON MPG MODE.

TO PRESS THE SPINDLE STOP SWITCH (26) AND THE SPINDLE ORIENTATION BE EXECUTED.

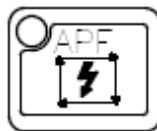
(3.)TO PRESS +C SWITCH (37), THE C AXIS AND SPINDLE BE COMBINED.

(4.)TO PRESS -C SWITCH (36), THE C AXUS AND SPINDLE BE BREAKEN AWAY.



(45) AUTO POWER OFF SWITCH : (OPTION)

When the switch is “ON” and block with M30 (program end) when execute program , machine will power off after 20 seconds (timer set from diagnose parameter) ; Before power off , to press “CYCLE START(29)” 、” RESET” or the switch can cancel this function .



(46) WORK LLIGHT SWITCH :

When the switch is “ON” on any mode , work lamp will be lighten .



(47) ITRL SWITCH

TO PRESS THIS SWITCH AT MANUAL MODE. THE SAFETY DOOR SWITCH WILL BE RELEASED 8 SECONDS. AFTER 8 SECONDS IT IS LOCKED.

M00.M01.M02.M03 AND COMMAND DRIVING ALL CAN TO RELEASE.



### (48) CHIP(CONVEYOR) CCW SWITCH.(FOR ALL MODES)

TO PRESS THIS SWITCH ON AND THE CHIP AFTER THE MACHINE BE CCW.  
AND TO PRESS THIS SWITCH OFF THE CHIP BE STOP.  
TO DRIVE THE CHIP RATATION BY COMMAND M21.TO DRIVE THE CHIP STOP  
BY COMMAND M22. TO DRIVE THE CHIP CCW BY COMMAND M23.



### (49) GEAR N TURNING SPINDLE GEAR N SWUTCH(FOR MAUNAL MODE)

TO PRESS THIS SWITCH AND THE SPINDLE GEAR BE CAHNGED TO GEAR N FOR  
MAUNAL MODE.  
TO DRIVE THE SPINDLE GEAR BE CHANGE TO GEAR N BY COMMAND M40 FOR  
MANUAL MODE.  
THE TURNING SPINDLE BE CHANGED TO C AXIS THEN THIS SWITCH IS INVALID.

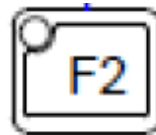


### (50) F1(SAPRE)



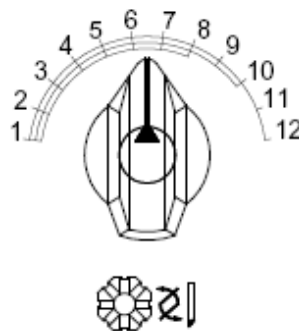
### (51) F2 (CS AXIS MODE )SWITCH(MPG MODE)

Press SHIFT key and press the F2 key for enter the CS axis mode.



### (52) TOOL SELECTION SWITCH

AFTER SELECTING THE TOOL NUMBER TO PRESS THIS SWITCH AND THE TURRET BE  
ROTATED TO THE TOOL NUMBER BE SET.

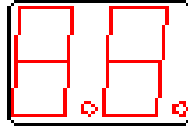


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**CHAPTER.2 FUNCTION OF OPERATER'S PANEL**

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- (53) DISPLAY NUMBER OF TOOL  
TO DISPLAY CURRENT NUMBER OF TOOL.




2.4 EXTERNAL OPERATE SWICH OR GUIDING LAMP

- (1) SPINDLE OIL CHUCK CONTROL FOOT SWITCH : MANUAL MODE OR PROGRAM TO AND SPINDLE STOP HAVE VALID, WHEN CHUCK GUIDING LAMP ON(2.2.1(40)),DIE OUT SUSPEND、END.EXPRESS CHUCK NOT STRICT、PRESS FOOT SWITCH LAMP. CHUCK STRICT AND GUIDING ON、SPINDLE CAN BE RUN；IF AGAIN PRESS FOOT SWITCH、CHUCK RELEASE AND GIIDING LAMP OFF THIS FOOT SWITCH RUT IN FRONT OF SPINDLE
- (2) R、Y、G ALARM LAMP : TO STATE DISPLAY。
  - RED ALARM LAMP : LAMP TO GLISTEN、MACHINE HAVE ALARM STATE、THIS TIME、MACHINE NOT AUTO RUN、MUST CLEAN ALARM STATE,CAN BE AUTO RUN。
  - YELLOW ALARM LAMP : LAMP TO GLISTEN、MACHINE IN AUTONRUN HAVE TO SUSPEND OR EXECUTE ALREADY END、PROGRAM EXECUTE M00, M01, M02orM30 INSTRUCT。
  - GREEN ALARM LAMP : LAMP TO GLISTEN、MACHINE MORMAL TO WORK

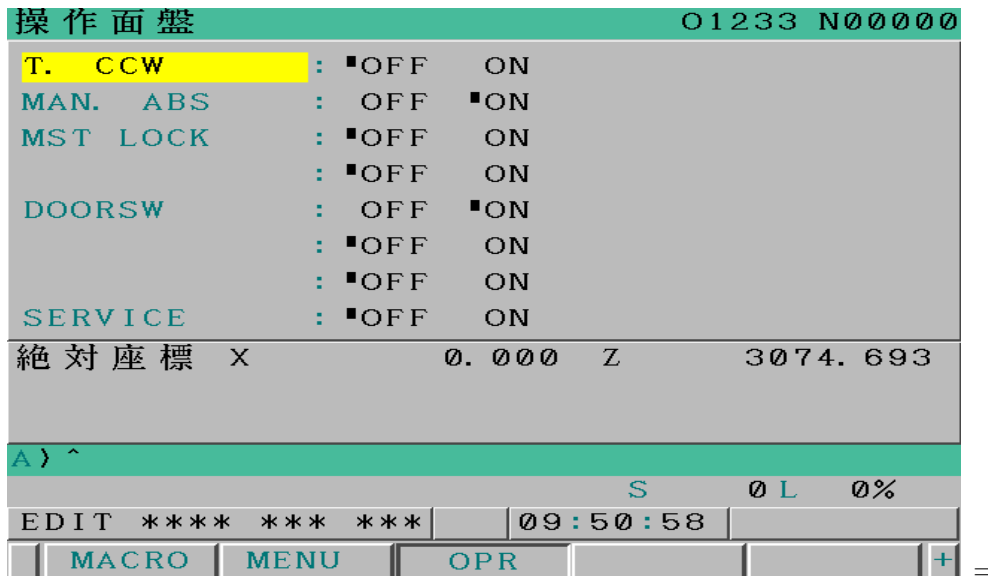
## 2.5 DISPLAY AND SETTING THE SOFTWARE OPERATOR'S PANEL

(1) DEPRESS FUNCTION KEY  OF THE MDI/EDIT PANEL.

(2) DEPRESS THE  CONTINUOUS MEUN KEY.

(3) THEN DEPRESS THE CHAPTER SELECTION SOFT KEY[([OPR])].

(4) DEPRESS THE  NEXT PAGE KEY. DISPLAY AS FOLLOW



(5) MOVE THE CURSOR TO THE DESIRED SWITCH BY PRESS CURSOR KEY  O 

(6) PUSH THE MOVE CURSOR KEY TO THE ON POSITION 

(7) PUSH THE MOVE CURSOR KEY TO THE OFF POSITION 

(8) SOFTWARE SWITCH DESCRIPTION. :

1. T. CCW : TURRET ANTICLOCKWISE S.W. ◦

SWITCH IN OFF POSITION , MANUAL TUREET CW S.W(2.2.1 (23))CAN USE TURRET CW ;  
SWITCH IN ON POSITION , MANUAL TURRET CW S.W(2.2.1 (23))CAN USE TURRET CCW ◦

2. MAN. ABS : MANUAL ABSOLUTE S.W. ◦

MAN.ABS S.W IN OFF POSITION , MAN.ABS CLOSE ;  
MAN ABS S.W IN ON POSITION , MAN.ABS FUNCTION VALID ◦ (SWITCH IN ON)  
(RELATE MAN.ABS FUNCTION , REFERENCE FANUC OPERATE MANUAL)

3. MST LOCK : ASSIST FUNCTION (MST CODE)LOCK SWITCH. ◦

ASSIST FUNCTION LOCK SWITCH "ON" , M,S ,T FUNCTION ALL NOT EXECUTE ,  
ONLY MACHINE EXECUTE DISPLACEMENT ◦  
BUT , ALREADY EXECUTE M,S ,T FUNCTION ALL CONTINUE EXECUTING ◦

4. DOOR INTERLOCK : DOOR USE INTERLOCK SWITCH. ◦

DOOR NOT USE INTERLOCK,WHEN SWITCH "OFF"  
DOOR USE INTERLOCK,WHEN SWITCH "ON"

5 SERVICE: SPINDLE MOTOR SERVICE MODE

SERVICE MODE NOT USE ,WHEN SWITCH "OFF"

SERVICE MODE USE ,WHEN SWITCH "ON"

THEN DISPLAY ALARM 2019(SPINDLE SERVICE MODE)

# CHAPTER 5

## PARAMETER SETTING

Product Date : \_\_\_\_\_

Product Numbers : \_\_\_\_\_

Program Number : \_\_\_\_\_

Machine Type : \_\_\_\_\_

Machine Number : \_\_\_\_\_

## 5.PARAMETER SETTING

### 5.1 PARAMETER PROTECT SWITCH

**NOTICE:** When non-necessity, please voluntarily do not revise the parameter or the diagnosis parameter, in order to avoid machine shutdown °

- (1) CHANGE MODE TO MDI °



- (2) MUST UNDER THIS MODE, ONLY THEN BE POSSIBLE TO REVISE THE PARAMETER OR THE PMC PARAMETER ° BEFORE THE REVISION, TURNS ON THE PARAMETER SOFTWARE PROTECTION SWITCH FIRST, THE METHOD IS AS FOLLOWS:

A. PRESS OFFSET SETTING FUNCTION KEY.





B. PRESS[SETTING]SOFT KEY.

C. PRESS  OR  , TRANSFERS TO THE VERNIER PWE PLACE.THE PICTURE IS AS FOLLOWS:

SETTING (HANDY)		O0000 N00000
PARAMETER WRITE =	1 (0 : DISABLE 1 : ENABLE)	
TV CHECK	= 0 (0 : OFF 1 : ON)	
PUNCH CODE	= 1 (0 : EIA 1 : ISO)	
INPUT UNIT	= 0 (0 : MM 1 : INCH)	
I/O CHANNEL	= 0 (0-3 : CHANNEL NO.)	
SEQUENCE NC.	= 0 (0 : OFF 1 : ON)	
TAPE FORMAT	= 0 (0 : NO CNV 1 : F10/11)	
SEQUENCE STOP	= 0 (PROGRAM NO.)	
SEQUENCE STOP	= 0 (SEQUENCE NO.)	
>_ MDI **** ** *		S 0 T0000
15:06:56		
[ 補正 ] [ <b>SETTING</b> ] [ 工件 ] [ ] [ (操作) ]		

ENTERS 1 IN PWE= PLACE, AGAIN PRESSES  THE KEY, THEN PWE=1, THIS D. TIME SCREEN APPEARANCE 100 P/S ALARM STASTUS,EXPRESSED SWITCH OF THE PARAMETER HYPOTHESIS HAS OPENED.

- 1.PRESSES  AND  , THEN MAY ELIMINATE 100 P/S ALARM TEMPORARILY.
- 2.IF REVISES THE PMC PARAMETER, THE FORMULA PROTECTION KEY SWITCH ALSO MUST OPEN.
- 3.AFTER CERTAIN PARAMETER REVISION, CAN PRODUCE 000 P/S ALARM TO SHOW THE CONDITION, NAMELY THE EXPRESSION CHANGED, BUT MUST CLOSE THE NC POWER SOURCE.

- THE CLOSURE PARAMETER SOFTWARE PROTECTION SWITCH, ITS METHOD AND THE ABOVE (3) STEP ARE SAME, ONLY IS THE PWE= PLACE HYPOTHESIS IS 0, AGAIN PRESSES  KEY, ELIMINATES 100 P/S ALARM TO SHOW THE CONDITION.



## 5.2 PMC PARAMETER DESCRIPTIONS AND SETTING

## 5.2.1 TIMER

TIMER NO.	ADDRESS.	VALUE	DESCRIPTION
T01	T00	960	M10/M11(CHUCK UNCLAMP/CLAMP) FINISH TIME
T02	T02	960	M10/M11(CHUCK UNCLAMP/CLAMP) ON DELAY TIME
T03	T04	960	QUILL EXTEND DIFFERENTIATE JOG/RUNNING TIME
T04	T06	1968	TURRET IS ORIENTATED ALARM CHUCK TIME
T05	T08	24960	POCKET DOWN SENSOR ALARM DELAY TIME
T06	T10	4992	AUTO POWER OFF DELAY TIME
T07	T12	960	TURRET CLAMP DELAY TIME
T08	T14	960	CHANGE GEAR FINISH TIME(M41,M42,M43,M44)
T09	T16	60000	CHANGE GEAR ALARM DELAY TIME AL1016
T10	T18		QUILL EXTEND FINISH TIME
T11	T20		QUILL BACKWARD FINISH TIME
T12	T22	12000	CHANGE GEAR FORWARD TIME
T13	T24	5000	CHANGE GEAR BACKWARD TIME
T14	T26	60000	CHIP MOTOR ON TIME
T15	T28	0	CHIP MOTOR OFF TIME
T16	T30		C AXIS LOW SPEED BRAKE FINISH TIME
T17	T32	48	TURRET ORIENTATE SENSOR DELAY TIME
T18	T34		H4 TURRET DOWN DELAY TIME
T19	T36	496	TURRET UNCLAMP DELAY TIME
T20	T38		
T21	T40	4000	LUBRICATING MOTOR ON TIME
T22	T42	3000	LUBRICATING MOTOR ON TIME DURING POWER ON
T23	T44		H4 TURRET UP DELAY TIME
T24	T46		H4 TURRET REVOLVE(DOWN) DELAY TIME
T25	T48		H4 TURRET REVOLVE(UP) DELAY TIME
T26	T50		
T27	T52		CHUCK CLAMP SENSOR CHECK TIME
T28	T54		CHUCK UNCLAMP SENSOR CHECK TIME
T29	T56		AUTO DOOR CLOSE SENSOR CHECK TIME
T30	T58		AUTO DOOR OPEN SENSOR CHECK TIME
T31	T60	1000	SPINDLE LOAD CHECK DELAY TIME
T32	T62	1000	DISPLAY SPINDLE LOAD ALARM DELAY TIME(AL2023)
T33	T64		
T34	T66		
T35	T68		
T36	T70		
T37	T72		HYDRUALIC CHANGE GEAR SPINLDE CW RUN TIME
T38	T74		HYDRUALIC CHANGE GEAR SPINLDE CCW RUN TIME
T39	T76		
T40	T78		

## 5.2.2 PLC KEEP RELAY DESCRIPTIONS

ADD.	BIT	SET	DESCRIPTION
K0	0	0 :	CHUCK CLAMP AND UNCLAMP FINISH IS CONTROLLED BY T01,T02
		1 :	CHUCK CLAMP AND UNCLAMP FINISH IS CONTROLLED BY EXTERNAL SWITCH.
	1	0 :	CHECK THE DOOR OPENING NOT USE SAFETY MODULE
		1 :	CHECK THE DOOR OPENING USE SAFETY MODULE
	2	0 :	USE CE FUNCTION
		1 :	NO USE CE FUNCTION
	3	0 :	LUBE ALARM NO SBK, AND NOT CYCLE START
		1 :	LUBE ALARM CAN SBK, BUT NOT CYCLE START
	4	0 :	WORKPIECE IS COUNTED FINISH,NOT EXECUTE EXTERNAL RESET.
		1 :	WORKPIECE IS COUNTED FINISH, EXECUTE EXTERNAL RESET.
	5	0 :	USE THE LUBRICATING WITHOUT TIMER
		1 :	USE THE LUBRICATING WITH TIMER
	6	0 :	X DIRECTION CONTROL SWITCH + 、 - DIRECTION ARE OPPOSITE(+X ZRN)
		1 :	X DIRECTION CONTROL SWITCH + 、 - DIRECTION ARE OPPOSITE(-X ZRN)
	7	0 :	EVERY AXES ZRN YET,CAN'T EXECUTING CYCLE START.
		1 :	EVERY AXES ZRN YET,CAN EXECUTING CYCLE START.
K1	0	0 :	WHEN CHUCK IS CLAMPED,SPINDLE JUST CAN RUN.
		1 :	WHEN CHUCK IS UNCLAMPED,SPINDLE ALSO CAN RUN.
	1	0 :	WHEN CHUCK IS UNCLAMPED,PRESSING CYCLE START IS INVALID.
		1 :	AFTER PRESSINF SBK,THE CHUCK UNCLAMP,SPINDLE CAN RUN AND CYCLE START IS VALID.
	2	0 :	M.S.T FUNCTION IS CONTROLLED BY AFL OF OPERATOR'S PANEL.
		1 :	M.S.T FUNCTION IS CONTROLLED BY MLK OF OPERATOR'S PANEL.
	3	0 :	NO USE 4TH AXIS
		1 :	USE 4TH AXIS
	4	0 :	NO USE 3TH AXIS
		1 :	USE 3TH AXIS
	5	0 :	DISPLAY THE ALARM MESSAGE OF CHUCK
		1 :	NOT DISPLAY THE ALARM MESSAGE OF CHUCK
	6	0 :	MLK IS EXECUTED,TO PRESS THE CYCLE START WILL NOT EMERGY THE ALARM MESSAGE.
		1 :	MLK IS EXECUTED,TO PRESS THE CYCLE START WILL EMERGY THE ALARM MESSAGE.
	7	0 :	CHANGE TO THE MANUAL MODE, THE EXTERNAL RESET IS EXECUTED.
		1 :	CHANGE TO THE MANUAL MODE, THE EXTERNAL ACTION IS KEPT.

## 5.2.2 PLC KEEP RELAY DESCRIPTIONS

ADD.	BIT	SET	DESCRIPTION
K2	0	0 :	X AXIS DIRECTION CONTROL SWITCH IN GENERAL.
		1 :	X AXIS DIRECTION CONTROL SWITCH IS OPPOSITE.
	1	0 :	THE WORKPIECE CATCHER IS EXTENDED,EVERY AXIS STILL CAN MOVE.
		1 :	THE WORKPIECE CATCHER IS EXTENDED,X 、 Z AXIS ARE LOCKED.
	2	0 :	SPINDLE IS RUNNING,QUILL CAN'T MOVE.
		1 :	SPINDLE IS RUNNING,QUILL STILL CAN BE BACKWARD.
	3	0 :	SPINDLE IS RUNNING,CAN'T TO EXECUTE M10/M11
		1 :	SPINDLE IS RUNNING,STILL CAN TO EXECUTE M10/M11
	4	0 :	THE CHUCK UNCLAMP,PRESSING CYCLE START OR SPINDLE RUNNING, NC ALARM IS EMERGED.
		1 :	THE CHUCK UNCLAMP,CAN CYCLE START OR SPINDLE RUNNING.
	5	0 :	AT AUTO MODE,PRESSING FEED HOLD,THE SPINDLE STILL RUNNING.
		1 :	AT AUTO MODE,PRESSING FEED HOLD,THE SPINDLE STOP RUNNING.
	6	0 :	M30 IS EXECUTED,THE PROGRAM IS STOPPED.
		1 :	M30 IS EXECUTED,THE PROGRAM IS SARTED FROM STARTING POINT.
	7	0 :	CHANGE TO AUTO MODE,THE EXTERNAL RESET IS EXECUTED.
		1 :	CHANGE TO AUTO MODE,THE MOVEMENT OF EXTERNAL IS KEPT.
K3	0	0 :	THE 2ND SPINDLE IS CHANGED TO THE AXIS OF MILLING, AND THE SPINLDE IS AT PROENTATE STATUS,THE LIMIT OF TWISTING FORCE IS NOT ON.
		1 :	THE 2ND SPINDLE IS CHANGED TO THE AXIS OF MILLING, AND THE SPINLDE IS AT PROENTATE STATUS,THE LIMIT OF TWISTING FORCE IS ON.
	1	0 :	WHEN M00 OR M01 IS EXECUTED, THE SPINDLE IS NOT STOPPED.
		1 :	WHEN M00 OR M01 IS EXECUTED, THE SPINDLE IS STOPPED.
	2	0 :	WHEN THE TOOL OF TURRET IS CHANGED, X AXIS MUST AT HOME, JUST CAN CHNGE TOOLS(SETTING BY K3.3).
		1 :	WHEN THE TOOL OF TURRET IS CHANGED, X AXIS CAN CHANGE TOOLS AT ANYWHERE.
	3	0 :	WHEN THE TOOL OF TURRET IS CHANGED, X AXIS MUST AT HOME.
		1 :	WHEN THE TOOL OF TURRET IS CHANGED, X AXIS MUST AT 2ND HOME.
	4	0 :	WHNE THE TOOL OF TURRET IS CHANGED, X AXIS AND Z AXIS CAN CHANGE TOOL AT ANYWHERE.
		1 :	WHEN THE TOOL OF TURRET IS CHANGED, X AXIS AND Z AXIS MUST AT HOME.
	5	0 :	POWER ON, THE EMG SWITCH MUST BE PRESSED JUST CAN POWER ON IN GENERAL.
		1 :	POWER ON, THE EMG SWITCH DON'T BE PRESSED CAN POWER ON IN GENERAL.
	6	0 :	CHANGE THE DIRECTION OF ROTATION OF 2ND SPINDLE
		1 :	CHANGE THE DIRECTION OF ROTATION OF 2ND SPINDLE
	7	0 :	CHECK THE SIGNAL OF AIR PRESSURE SWITCH
		1 :	NOT CHECK THE SIGNAL OF AIR PRESSURE SWITCH

## 5.2.2 PLC KEEP RELAY DESCRIPTIONS

ADD.	BIT	SET	DESCRIPTION
K4	0	0 :	THE PROGRAM IS EXECUTED M00 OR M01,THE COOLANT MOTOR NOT STOPPED.
		1 :	THE PROGRAM IS EXECUTED M00 OR M01,THE COOLANT MOTOR STOPPED.
	1	0 :	TIME OF THE CHIP MOTOR ON IS CONTROLLED BY TMR14 AND TMR15.
		1 :	THE CHIP MOTOR ON IS NOT CONTROLLED BY TIMER.
	2	0 :	NO USE C/S SPINDLE FUNCTION
		1 :	USE C/S SPINDLE FUNCTION
	3	0 :	THE LEVEL CHECK SWITCH OF LUBRICATING IS N.O.
		1 :	THE LEVEL CHECK SWITCH OF LUBRICATING IS N.C.
	4	0 :	PLC USE
		1 :	PLC USE
	5	0 :	THE 2ND SPINDLE IS REVOLVE,THE ALARM OF TURRET REVOLVE IS NOT EMERGED.
		1 :	THE 2ND SPINDLE IS REVOLVE,THE ALARM OF TURRET REVOLVE IS EMERGED(AL2114).
	6	0 :	USE LIO SHING SERVO TURRET
		1 :	NO USE LIO SHING SERVO TURRET
	7	0 :	THE CHECK CONTACT OF HIGH LEVEL OF COOLANT MOTOR IS N.O.
		1 :	THE CHECK CONTACT OF HIGH LEVEL OF COOLANT MOTOR IS N.C.
K5	0	0 :	USE CHANGE GEAR FUNCTION
		1 :	NO USE CHANGE GEAR FUNCTION
	1	0 :	WHEN THE ALARM OF LUBRICATING LEVEL LOW IS EMERGED,PRESSING CYCLE START IS ILVALID.
		1 :	WHEN THE ALARM OF LUBRICATING LEVEL LOW IS EMERGED,THE PROGRAM BECOME BSK.
	2	0 :	THE 2ND SPINDLE USE THE SPINDLE OF ANALOGY (INVERTER CONTROL)
		1 :	THE 2ND SPINDLE USE THE SPINDLE OF SERVO.
	3	0 :	SPINDLE WARN START FUNCTION IS VALID.
		1 :	SPINDLE WARN START FUNCTION IS ILVALID.
	4	0 :	THE SERVO AXIS BE TOUCHED BY LIMIT OF HARDWARE, THE ALARM IS EMERGED,EMG IS NOT EXECUTED BY CNC.
		1 :	THE SERVO AXIS BE TOUCHED BY LIMIT OF HARDWARE, THE ALARM IS EMERGED,EMG IS EXECUTED BY CNC.
	5	0 :	USE THE MOMERY FUNCTION OF GEAR
		1 :	NO USE THE MOMERY FUNCTION OF GEAR
	6	0 :	USE OVER TRAVE OF PREVENT TO STRIKE OF TURRET
		1 :	NO USE OVER TRAVE OF PREVENT TO STRIKE OF TURRET
	7	0 :	CHECK THE LOAD OF SPINDLE DURING CUTTING.
		1 :	CHECK THE LOAD OF SPINDLE WITHOUT CUTTING.

## 5.2.2 PLC KEEP RELAY DESCRIPTIONS

ADD.	BIT	SET	DESCRIPTION
K6	0	0 :	WHEN M30 AND M02 ARE EXECUTED,THE ALARM IS NOT DISPLAYED.
		1 :	WHEN M30 AND M02 ARE EXECUTED,THE ALARM IS DISPLAYED.
	1	0 :	WHEN THE C/S AXIS IS USED, USE THE LOW SPEED BRAKE FUNCTION.
		1 :	WHEN THE C/S AXIS IS USED, NOT USE THE LOW SPEED BRAKE FUNCTION.
	2	0 :	+X SWITCH OF PANEL CONTROLLED POSITIVE DIRECTION,-X SWITCH OF PANEL CONTROLLED NEGATIVE DIRECTION.
		1 :	-X SWITCH OF PANEL CONTROLLED POSITIVE DIRECTION,+X SWITCH OF PANEL CONTROLLED NEGATIVE DIRECTION.
	3	0 :	USE THE PRESSURE CHECK SWITCH OF HYDRUALIC.
		1 :	NO USE THE PRESSURE CHECK SWTICH OF HYDRUALIC.
	4	0 :	THE LEVEL LOW CHECK CONTACT OF CUTTING IS N.O.
		1 :	THE LEVEL LOW CHECK CONTACT OF CUTTING IS N.C.
	5	0 :	PROGRAM STOP WHEN OIL COOLER ALARM
		1 :	PROGRAM NOT STOP WHEN OIL COOLER ALARM
	6	0 :	USE 4TH AXIS
		1 :	NOT USE 4TH AXIS
K7	0	0 :	GUARD DOOR OPEN SPEED 50%
		1 :	GUARD DOOR OPEN SPEED 25%
	1	0 :	GUARD DOOR OPEN SPEED 25%
		1 :	GUARD DOOR OPEN SPEED50%
	2	0 :	THE ALARM OF SAFETY DOOR INTERLOCK IS NOT DISPLAYED.
		1 :	THE ALARM OF SAFETY DOOR INTERLOCK IS DISPLAYED.
	3	0 :	USE HRDRAULIC CHANG GEAR
		1 :	NOT USE HRDRAULIC CHANG GEAR
	4	0 :	MUST DETECT HYDRAULIC PRESSURE WHEN QUILL FORWARD
		1 :	MUST DETECT HYDRAULIC PRESSURE ANYTIME
	5	0 :	USE LUBE PRESSURE L.S
		1 :	NOT USE LUBE PRESSURE L.S
	6	0 :	C AXIS IN CF AUTO BRAKE LOW ON
		1 :	C AXIS IN CF AUTO BRAKE LOW OFF
	7	0 :	USE HYDRAULIC CHUCK
		1 :	NOT USE HYDRAULIC CHUCK

## 5.2.2 PLC KEEP RELAY DESCRIPTIONS

ADD.	BIT	SET	DESCRIPTION
K8	0	0 :	USE SPINDLE HEAD COVER L.S
		1 :	NOT USE SPINDLE HEAD COVER L.S
	1	0 :	USE BACK DOOR CLOSE L.S
		1 :	NOT USE BACK DOOR CLOSE L.S
	2	0 :	
		1 :	
	3	0 :	USE STOCKBODY LOCK PIN
		1 :	NOT USE STOCKBODY LOCK PIN
	4	0 :	USE SPINDLE GEAR PRESSURE L.S
		1 :	NOT USE SPINDLE GEAR PRESSURE L.S
	5	0 :	USE EXT. EMERGENCY STOP
		1 :	NOT USE EXT. EMERGENCY STOP
	6	0 :	NOT USE SPINDLE V.R
		1 :	USE SPINDLE V.R
	7	0 :	WITH LIMIT FOR LOCKED AXIS*IT
		1 :	WITH NOT LIMIT FOR LOCKED AXIS*IT
K10	0	0 :	PLC MEMORY USE
		1 :	PLC MEMORY USE
	1	0 :	PLC MEMORY USE
		1 :	PLC MEMORY USE
	2	0 :	
		1 :	
	3	0 :	USE Electromechanical TURRET
		1 :	NOT USE Electromechanical TURRET
	4	0 :	
		1 :	
	5	0 :	
		1 :	
	6	0 :	NOT USE H6 TURRET SERVICE MODE
		1 :	USE H6 TURRET SERVICE MODE
	7	0 :	NOT USE H6 TURRET
		1 :	USE H6 TURRET

## 5.2.2 PLC KEEP RELAY DESCRIPTIONS

ADD.	BIT	SET	DESCRIPTION
K13	0	0 :	SPINDLE USE GEAR 4TH
		1 :	SPINDLE USE GEAR 2ND
	1	0 :	NOT USE ABS HYDRAULIC TURRET
		1 :	USE ABS HYDRAULIC TURRET
	2	0 :	THE LIMIT OF TWISTING FORCE IS NOT STARTED DURING CHANGING GEAR.
		1 :	THE LIMIT OF TWISTING FORCE IS STARTED DURING CHANGING GEAR.
	3	0 :	THE SPEED OF SPINDLE JOG DEPEND ON DIFFERENT GEAR
		1 :	THE SPEED OF SPINDLE JOG DEPEND ON LOW GEAR SPEED.
	4	0 :	
		1 :	
	5	0 :	
		1 :	
	6	0 :	QUILL PRESSURE S.W USE A CONTACT(NO)
		1 :	QUILL PRESSURE S.W USE B CONTACT(NC)
	7	NO	STOCKBODY CHUCK S.W USE A CONTACT(NO)
		1 :	STOCKBODY CHUCK S.W USE B CONTACT(NC)

## 5.2.2 PLC KEEP RELAY DESCRIPTIONS

ADD.	BIT	SET	DESCRIPTION
K14	0	0 :	TURRET FIRST TOOL AT ELECTRIAL BOX SIDE
		1 :	TURRET FIRST TOOL AT OPERATION BOX SIDE
	1	0 :	TOOL CHANGE NOT IN HOME MANUAL MODE
		1 :	TOOL CHANGE MUST IN HOME MANUAL MODE
	2	0 :	USE SPINGLE POSITIONING(M19) WITH ZERO SPEED
		1 :	USE SPINGLE POSITIONING(M19) WITHOUT ZERO SPEED
	3	0 :	USE X AXIS OT
		1 :	NOT USE X AXIS OT
	4		QUILL CONTROL BY EXT. S.W(FOOT SWITCH)
		1 :	QUILL CONTROL BY OPERATION PANEL
	5	0 :	USE HYDRAULIC MOTOR
		1 :	NOT USE HYDRAULIC MOTOR
	6	0 :	STANDARD ABS HYDRAULIC TURRET
		1 :	POWER OFF TURRET UNCLANP(LOCKPIN TYPE TURRET)
K15	0	0 :	TURRET CAN START WHEN DOOR OPEN
		1 :	TURRET CAN'T START WHEN DOOR OPEN
	1	0 :	NOT USE TAILSTOCK BACKWARD OT
		1 :	USE TAILSTOCK BACKWARD OT
	2		TAILSTOCK TRACTION OT USE A CONTACT(NO)
		1 :	TAILSTOCK TRACTION OT USE B CONTACT(NC)
	3	0 :	USE TAILSTOCK OT
		1 :	NOT USE TAILSTOCK OT
	4	0 :	GEAR HIGH/LOW ARRIVED THEN GEAR 1ST,2ND SOL ON, WHEN GEAR CHANGE
		1 :	CHANGE GEAR BY SOL AT THE SAME TIME, WHEN GEAR CHANGE
	5	0 :	USE Z AXIS OT
		1 :	NOT USE Z AXIS OT
	6	0 :	NOT USE TAILSTOCK PRESSURE L.S
		1 :	USE TAILSTOCK PRESSURE L.S
	7	0 :	USE TURRET
		1 :	NOT USE TURRET



## 5.2.2 PLC KEEP RELAY DESCRIPTIONS

ADD.	BIT	SET	DESCRIPTION
K16	0	0 :	NOT DETECTING SPINDLE STALL
		1 :	DETECT SPINDLE STALL
	1	0 :	NOT USE TAILSTOCK SET PIN
		1 :	USE TAILSTOCK SET PIN
	2	0 :	NOT USE TAILSTOCK BODY CLAMP/UNCLAMP SIGNAL
		1 :	USE TAILSTOCK BODY CLAMP/UNCLAMP SIGNAL
	3	0 :	TAILSTOCK BODY CLAMP/UNCLAMP USE A CONTACT(NO)
		1 :	TAILSTOCK BODY CLAMP/UNCLAMP USE B CONTACT(NC)
	4		NOT USE TAILSTOCK BODY CLAMP/UNCLAMP SOL
		1 :	USE TAILSTOCK BODY CLAMP/UNCLAMP SOL
	5	0 :	NOT USE TAILSTOCK BODY MANUAL ENABLE S.W(F1)
			USE TAILSTOCK BODY MANUAL ENABLE S.W(F1)
	6	0 :	NOT USE DOOR INTERLOCK
		1 :	USE DOOR INTERLOCK
	7	0 :	
		1 :	
K17	0	0 :	NOT USE SPINDLE COOLER EXT. S.W
		1 :	USE SPINDLE COOLER EXT. S.W
	1	0 :	TAIL LUBRICATION MOTOR OVERLOAD SIGNAL IS X3.3
		1 :	TAIL LUBRICATION MOTOR OVERLOAD SIGNAL IS X10.2
	2	0 :	NOT USE SUCK MOTOR
		1 :	USE SUCK MOTOR
	3	0 :	USE HIGH PRESSURE THERMAL HIGH DETECTION
		1 :	NOT USE HIGH PRESSURE THERMAL HIGH DETECTION
	4	0 :	
		1 :	
	5	0 :	USE EXT. MPG
		1 :	USE EXT. MPG, TRADITION SINGLE MPG FOR ALL AXIS
	6	0 :	NOT CHECK SPINDLE CHUCK POSSIYION BEFORE CYCLE START
		1 :	CHECK SPINDLE CHUCK POSSIYION BEFORE CYCLE START
	7	0 :	
		1 :	

## 5.2.3 PMC COUNTER SETTING LIST :

ADDRESS	SETTING	DESCRIPTION
C00	8	TOTAL TOOLS OF TUREET
C02	TOOL AT PRESENT	THE TURRET IS AIMED THE TOOL NUMBER OF SPINDLE
C04	900	SETTING THE TIME OF LUBRICATING MOTOR STOP, SETTING UNIT 1=1.
C06		THE COUNT VALUE OF STOP TIME OF LUBRICATING,WHEN THE SETTING VALUE=C04,THE LUBRICATING MOTOR ON.

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**5.2.4 PLC DATA DESCRIPTION & SETTING**

(一) WHEN SPINDLE DOOR SAFTY,SPINDLE JOG SPEED LIMIT:

D 0 : SPINDLE AT GEAR LOW(1)!

D 2 : SPINDLE AT GEAR MIDDLE LOW(2)!

D 4 : SPINDLE AT GEAR MIDDLE HIGH(3)!

D 6 : SPINDLE AT GEAR HIGH(4)!

(二)

D 8 : SPINDLE GEAR CHANGE,SPINDLE CW/CCW SPEED

(三) WHEN SAFTY DOOR TRIP,SPINDLE LOWEST SPEED:

D12 : SPINDLE AT GEAR LOW(1)!

D14 : SPINDLE AT GEAR MIDDLE LOW(2)!

D16 : SPINDLE AT GEAR MIDDLE HIGH(3)!

D18 : SPINDLE AT GEAR HIGH(4)!

(四) SPINDLE SPEED HIGHEST LIMIT(PARAMETER 3772):

D20 : SPINDLE AT GEAR LOW(1)!

D24 : SPINDLE AT GEAR MIDDLE LOW(2)!

D28 : SPINDLE AT GEAR MIDDLE HIGH(3)!

D32: SPINDLE AT GEAR HIGH(4)!

(五) SPINDLE SOFT KEY ON/OFF TIME(PARAMETER 4030):

D40 : SPINDLE AT GEAR LOW(1)!

D44 : SPINDLE AT GEAR MIDDLE LOW(2)!

D48 : SPINDLE AT GEAR MIDDLE HIGH(3)!

D52: SPINDLE AT GEAR HIGH(4)!

(六) SPINDLE MANUAL V.R SPEED,( WHEN K6.8=1):

D60 : SPINDLE AT GEAR LOW(1)!

D62 : SPINDLE AT GEAR MIDDLE LOW(2)!

D64 : SPINDLE AT GEAR MIDDLE HIGH(3)!

D66: SPINDLE AT GEAR HIGH(4)!

(七) SET SPINDLE SPEED TO DETECT GEARBOX PRESSURE:

D70 : SPINDLE AT GEAR LOW(1)!

D74 : SPINDLE AT GEAR MIDDLE LOW(2)!

D78 : SPINDLE AT GEAR MIDDLE HIGH(3)!

D82: SPINDLE AT GEAR HIGH(4)!

## 5.3 TURRET ERROR DESCRIPTION

## 6H HYDRAULIC TURRET ERROR &amp; DEBUG

step1	change to MDI mode
step2	set K10.6 to 1
step3	Press the start button the turret control panel, until the lights start flashing turret and release, lights flashing indicates the maintenance mode is on
step4	PRESS OP PANEL +X TURRET UP, AND OBSERVING SOL ON/OFF, TURRET UP SIGNAL X14.7=1
	PRESS OP PANEL -X TURRET DOWN, AND OBSERVING SOL ON/OFF, TURRET DOWN SIGNAL X14.6=1
	PRESS OP PANEL +Z TURRET CW, AND OBSERVING SOL ON/OFF, TURRET CW SIGNAL X14.5=1
	PRESS OP PANEL -Z TURRET CCW, AND OBSERVING SOL ON/OFF, TURRET CCW SIGNAL X14.4=1
step5	set K10.6 to 0
step6	change gear manually for check activity

## ABS HYDRAULIC TURRET TOOL ERROR &amp; DEBUG

step1	change to HOME mode
step2	PRESS TURRET CW SWITCH
step3	CHECK TURRET IN TOOL NO.1 POSITION.
step4	CHANGE TO JOG MODE, TRY AGAIN

## 5.4 MACHINE EXTERNAL ALARM MESSAGE LIST

ALARM NO.	DESCRIPTION
1002	DOOR OPEN
1003	SPINDLE ALARM
1006	CHUCK UNCLAMP
1007	T—CODE SELECT ALARM
1008	AXIS MUST ZERO RETURN
1009	TURRET NOT ORIENT
1011	TURRET RUN TIMER OVER
1012	GEAR OSITION ERROR
1013	TURRET NUMBER ERROR
1014	2ND. SPINDLE ALARM
1016	GEAR CHANGE TIMER OVER
1018	HYDRAULIC PERSSURE LOW
1019	TURRET MOTOR OVERLOAD
1020	QUILL RETRACT SENSOR ERROR
1021	QUILL ADVANCE OVERTRAVEL
1023	SPINDLE OIL COOLER OVERLOAD
1042	PLEASE RELEASE EMG. SWITCH AGAIN
1061	H6 TURRET SOL ERROR
1062	H6 TURRET SENSOR ERROR
1063	CHUCK GUARD OPEN
1064	REAR WINDOW OPEN
1066	TAILSTOCK LOCK PIN IN
1110	HYDRAULIC MOTOR OVERLOAD
1111	COOLANT MOTOR OVERLOAD
1112	COOLANT NO2. MOTOR OVERLOAD
1113	CHIP MOTOR OVERLOAD
1114	TAILSTOCK BODY MOTOR OVERLOAD
1140	X AXIS OT
1150	Z AXIS OT
1190	PLS. EXEC. TURRET HOME
1121	PUMPING MOTOR OVERLOAD
1122	Tank level is low
1123	COOLANT MOTOR OVERHEATING

## 5.4 MACHINE EXTERNAL ALARM MESSAGE LIST

ALARM NO.	DESCRIPTION
1280	CHUCK IN SENSOR ERR.(X010.3)
1290	CHUCK OUT SENSOR ERR.(X010.4)
1300	CHUNK IN OR OUT SENSOR ERROR
1330	AIR PRESSURE LOW ALARM
1340	DOOR CLOSE OR OPEN SENSOR ERROR
1350	DOOR OPEN SOL ERROR
1360	DOOR CLOSE SOL
1370	DOOR CLOSE SENSOR ERROR
1380	DOOR OPEN SENSOR ERROR
2004	LUBE LEVEL LOW ALARM
2005	LUBE PRESSURE LOW
2017	SPINDLE OIL COOLER FAULT
2018	SPINDLE GEAR PRESSURE LOW
2019	SPINDLE SERVICE MODE
2023	SPINDLE LOAD ALARM
2074	TURRET UNCLAMP CONFIRM
2075	TURRET CLAMP CONFIRM
2076	TURRET CW CONFIRM
2077	TURRET CCW CONFIRM
2080	TAILSTOCK BODY BACK OVERTRAVEL
2081	TAILSTOCK BODY FORWARD OVERTRAVEL
2082	TAILSTOCK BODY NOT UNCLAMP
2090	GUARD DOOR OPEN!!
2114	2 SPINDLE RUNNING
2120	M00 PROGRAM STOP
2121	M30 PROGRAM END
2122	AUTO POWER OFF ON ....
2124	M01 PROGRAM OPTIONAL STOP
2125	M02 PROGRAM END
2129	GEAR ERROR
2200	The filter is blocked or abnormal, replace the

## 5.5 M CODE LIST

M CODE	FUNCTION	DESCRIPTION
M00	PROGRAM STOP	
M01	OPTION STOP	
M02	PROGRAM END	
M03	SPINDLE CW	
M04	SPINDLE CCW	
M05	SPINDLE STOP	
M07	MILLING COOLANT ON	
M08	COOLANT ON	
M09	COOLANT OFF	
M10	CHUCK CLAMP	
M11	CHUCK UNCLAMP	
M13	SPINDLE CW & COOLANT ON	
M14	SPINDLE CCW & COOLANT ON	
M15	SPINDLE STOP & COOLANT OFF	
M19	ORIENTED SPINDLE STOP	
M20	ORIENTED SPINDLE STOP CANCEL	
M21	CHIP CONVEYOR CW	
M22	CHIP CONVEYOR STOP	
M23	CHIP CONVEYOR CW	
M24	AUTO DOOR OPEN	
M25	AUTO DOOR CLOSE	
M26	DOOR BYPASS OPEN	
M27	DOOR BYPASS CLOSE	
M28	TOOL COUNTER	
M29	RIGID TAPPING	
M30	PROGRAM REWIND	
M31	IGNORE CHUCK MESSAGE OPEN	
M32	IGNORE CHUCK MESSAGE CLOSE	
M33	QUILL BACKWARD	
M34	QUILL FORWARD	
M35	COOLANT NO.2 ON	
M36	COOLANT NO.2 OFF	
M40	SPINDLE GEAR NETURAL	
M41	SPINLDE GEAR 1	
M42	SPINLDE GEAR 2	
M43	SPINLDE GEAR 3	
M44	SPINLDE GEAR 4	
M46	C AXIS MODE	
M47	SPINDLE MODE	

**5.5 M CODE LIST**

<b>M CODE</b>	<b>FUNCTION</b>	<b>DESCRIPTION</b>
M51	AUTO FEED ON	
M56	C/S AXIS HIGH SPEED BRAKE	
M57	CLOSE C/S AXIS HIGH SPEED BRAKE	
M60	C/S AXIS LOW SPEED BRAKE	
M61	CLOSE C/S AXIS LOW SPEED BRAKE	
M62	TAILSTOCK CHUCK CLAMP	
M63	TAILSTOCK CHUCK UNCLAMP	
M70	CHAMFER ON	
M71	CHAMFER OFF	
M72	OVERRIDE CANCEL ON	
M73	OVERRIDE CANCEL OFF	
M74	X AXIS MIRROR IMAGE ON	
M75	X AXIS MIRROR IMAGE OFF	