

ACER® MACHINE TOOLS

Vertical Milling Center-**ARM TYPE**

CNC : FAGOR 8055i/FL- MC(ACER EMC-2240A)

Full-Key / 10.4" Color TFT LCD

USB + Ethernet + RS232C Interface

SERCOS Interface

Driver : FAGOR Servo Driver System

Spindle : SCD 1.35-S0-0 / FS5-A075-S1C1-E01

X,Y Axes : ACSD 16H / FKM 42.30A.E3.000

Z Axis: ACSD 16H / FKM 42.30A.E3.010

A Axis: ACSD 16H / FKM 42.30A.E3.000

Machine Specification :

- 1. Full-Guard with Interlock Switch**
- 2. ARM-Type 24 Tools**
- 3. Axes Portable Hand Wheel + 3 Colors Pilot Lamp**
- 4. Coolant Pump & Splash Coolant Function**
- 5. Chip-Conveyor Function**
- 6. 4-th Axis Rotary Table Function**
- 7. CTS Coolant Function**

Power Up :

Check the main power voltage : AC 230-400V

Check the power phase : L1,L2,L3

Check the earth connection : PE

Put the Air to machine :

Check the air pressure indicator : > 6 Kg/cm²

Check the Scale air pressure : > 1 Kg/cm²

Add the Oil :

Check the axis lubrication unit oil level

Machine Operation :

Start-Up

1. Close the Door guard and Side-Door
2. Release the E-stop Button
3. Press the “ESC” to clear errors or alarms messages : **CNC Ready**
4. Press the “Control Ready” button : **Servo Power On**
5. Manual moving the 3-axes to safety area
6. Machine need to Home Search : **Z→X Y**
7. Checking the Tool Magazine.

ISO Work Mode :

The monitor is divided into the following areas or display windows:



- 1.- This window indicates the selected operating mode, as well as the program number and the number of active blocks.

The program status is also indicated (in execution or interrupted) and if the DNC is active.

- 2.- This window indicates the time in the “ hours : minutes : seconds “ format.

- 3.- This window displays the Messages sent to the operator from the part program or via DNC.

The last message received will be shown regardless of where it has come from.

- 4.- This window will display messages from the PLC.

If the PLC activates two or more messages, the CNC will always display the one with the highest priority, which is the message with the smallest number. In this way, MSG1 will have the highest priority and MSG128 will have the lowest.

In this case the CNC will display the character + (plus sign), indicating that there are more messages activated by the PLC, it being possible to display them if the ACTIVE MESSAGE option is accessed in the PLC mode.

In this window the CNC will also display the character * (asterisk), to indicate that at least one of the 256 user-defined screens is active.

The screens which are active will be displayed, one by one, if the ACTIVE PAGES option is accessed in the PLC mode.

5.-Main window.

Depending on the operating mode, the CNC will show in this window all the information necessary.

When a CNC or PLC error is produced the system displays this in a superimposed horizontal window.

The CNC will always display the most important error and it will show:


- * The "down arrow" key to indicate that another less important error has also occurred and to press this key to view its message.
- * The "up arrow" key to indicate that another more important error has also occurred and to press this key to view its message.

6.-Editing window.

In some operating modes the last four lines of the main window are used as editing area.



7.-CNC communications window (errors detected in edition, nonexistent program, etc.)

8.- This window displays the following information:

SHF	Indicates that the SHIFT key has been pressed to activate the second function of the keys. For example, if key  is pressed after the SHIFT key, the CNC will understand that the "\$" character is required.
CAP	This indicates capital letters (CAPS key). The CNC will understand that capital letters are required whenever this is active.
INS/REP	Indicates if it is insert mode (INS) or substitution (REP) mode. It is selected by means of the INS key.
MM/INCH	Indicates the unit system (millimeters or inches) selected for display.

9.- Shows the different options which can be selected with soft-keys F1 thru F7.

MC Work Mode :

Both on CNC power-up and after the keystroke sequence:   the CNC acts as follows:

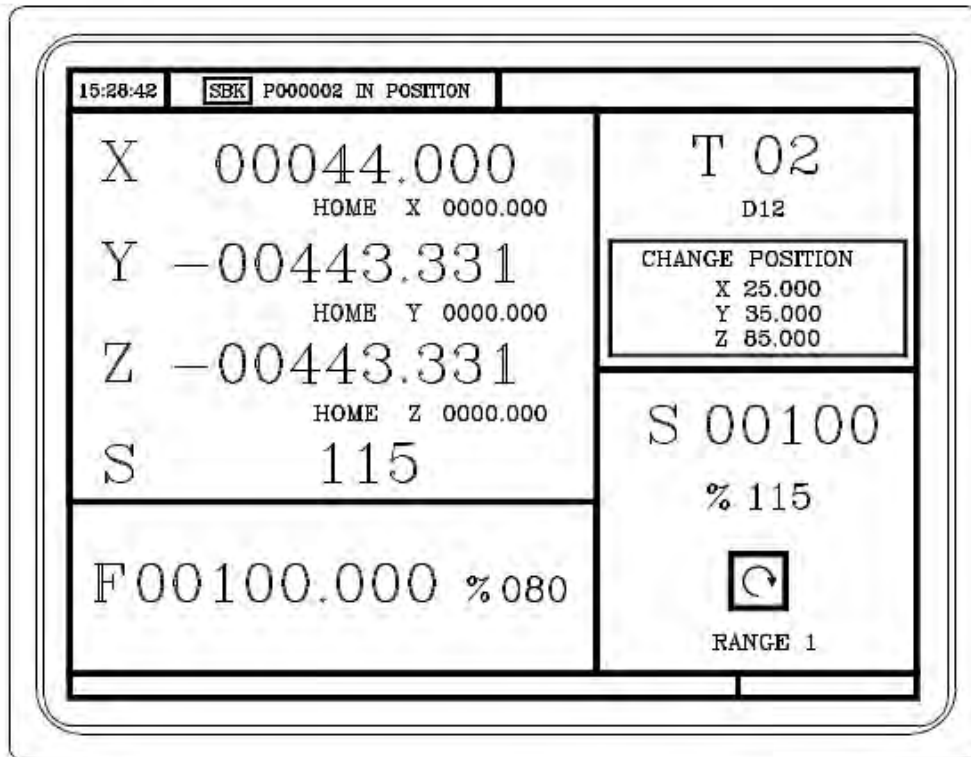
Shows «page 0» if it has been defined by the manufacturer. To access this operating mode, press any key.

If there is no «page 0», the CNC will display the standard screen for the selected work mode.

There are two operating modes: MC mode and M mode. To switch from one mode to the other, press



The standard MC mode screen is:

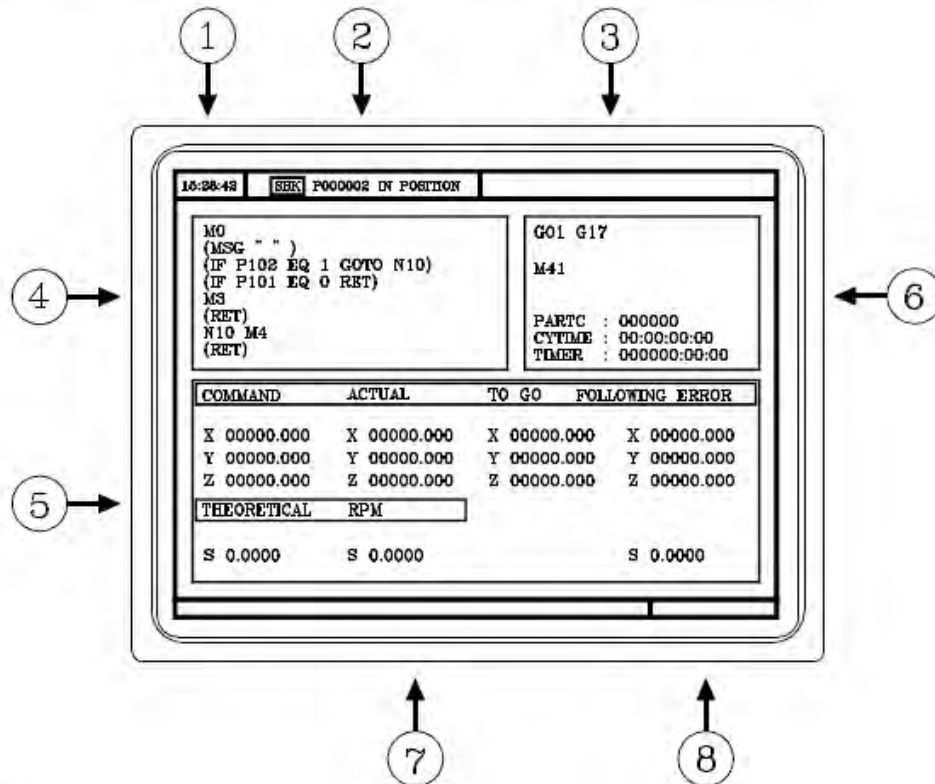


If one presses key



The CNC displays the special MC operating mode screen

The standard MC operating mode screen contains the following information:



1.- Clock

2.- This window can display the following data:

SBK when the Single Block execution mode is selected.
 DNC when the DNC mode is activated.
 P..... number of the program selected.
 Message «In Position» - «Execution» - «Interrupted» - «RESET»
 PLC messages

3.- The CNC messages are shown in this window.

4.- This window can display the following data:

- * The X, Y, Z coordinates of the axes.
- * In small characters, the axis coordinates referred to machine zero reference (home). This values are very useful when allowing the operator to set a tool change position (see zone 6). The CNC does not show this data when text 33 has not defined in program 999997.
- * The coordinates of the auxiliary axes which are defined.
- * The real spindle rpm "S".

5.- The information shown in this window depends on the position of the left-hand switch.

In all cases, it shows the feedrate of the «F» axes that has been selected and the % of F being applied.

When Feed-hold is active, the feedrate value changes colors.

Trouble shooting for FAGOR 8055i MC

ERRORS MESSAGES:

1. TOOL POCKET DOWN OVERTIMES

2. TOOL POCKET UP OVERTIMES

Cause:

When the CNC is executing the tool-pockets of the magazine-turret Down\Up function, it isn't finish inside 7 seconds.

Trouble shooting:

Check the magazine-position, pocket up/down sensors, air solenoids and air pressure if they are working correctly.

3. TOOL CLAMPING OVERTIMES

4. TOOL UNCLAMPING OVERTIMES

Cause:

When the CNC is executing the Tool Un\Clamping function, it isn't finish inside 5 seconds.

Trouble shooting:

Check the limit switches, air solenoids and air pressure of the tool clamp devices if they are working correctly.

5. TOOL POCKET COUNTING SENSOR MISSING

Cause:

When the CNC is executing the Tool-changed function or manual tool magazine-turret turning, it isn't finish inside 6 seconds.

Trouble shooting:

Check the counter sensors and the AC motor of the tool magazine-turret if they are working correctly.

6. TOOL MAGAZINE HOMING OVERTIMES

Cause:

When the CNC is executing the **M69** function tool magazine-turret home turning, it isn't finish inside 20 seconds.

Trouble shooting:

Check the counter, home sensors and the AC motor of the tool magazine-turret if they are working correctly.

7. 4-AXIS CLAMPING OVERTIMES

8. 4-AXIS UNCLAMPING OVERTIMES

Cause:

When the CNC is executing or manual 4-axis rotary table unclamping function, it isn't finish inside 5 seconds.

Trouble shooting:

Check the limit switches, air or oil solenoids and air or oil pressure of the 4-axis rotary table if they are working correctly.

9. MAGAZINE HOMING FAIL (POC DOWN & ARM NOT AT HOME)

10. POCKET UP/DOWN FAIL (ARM NOT AT HOME)

11. TOOL SEARCH FAIL (POC DOWN & ARM NOT AT HOME)

Cause:

When the magazine turret want to turning and the pocket of the tool magazine-turret not in the ready position and the arm is not on the home position.

Trouble shooting:

To execute the M-function (**M82** : Tool-pocket up) to make the tool pocket up.

Check the magazine-position, pocket up/down sensors, air solenoids and air pressure if they are working correctly.

Check the sensors of the Arm to confirm correctly condition position.

Manual turning the Arm's motor-shift by the wrench to turning the Arm go back to the home position. Firstly release the motor brake function by push the brake released bat on the top position of the Arm's motor.

12. TOOL NOT FOUND

13. SPECICAL TOOL NOT FOUND

Cause:

When the CNC is executing the next tool or the special tool search function and alarms happen make fail.

Trouble shooting:

To execute the magazine turret home return (**M69**), then execute the tool magazine turret pockets table reorganized (**M70**) function.

Changed the CNC mode to 8055-M mode, going into the "Table" function selecting the "Tool Magazine Table" item. Then to check if the "Active Tool Number" and "Tool Magazine Pocket Table" is as same as the spindle tool currently active on the machine.

Check tool table if it had any special tool setting by the tool family codes (>200).

14. T-CHANGE INHIBIT (MAGAZINE NEED TO HOME)

15. NEED CHECK TOOL MAGAZINE TABLE

Cause:

The tool-changed is not finished by external E-Stop, CNC Errors, others alarms and make the Tool- changed failure. The Arm stop and the “Spindle Tool” and “Pocket Tool” had been to change but not finish completely. Under this condition, you must continue finish the tool-changed steps and did some troubleshooting function to let the CNC in the ready.

Trouble shooting:

To execute the magazine turret home return (**M69**), then execute the tool magazine turret pockets table reorganized (**M70**) function.

Changed the CNC mode to 8055-M mode, going into the “Table“ function selecting the “Tool Magazine Table” item. Then to check if the “Active Tool Number” and “Tool Magazine Pocket Table” is as same as the spindle tool currently active on the machine.

16. MAGAZINE MOTOR OVERLOADS

17. ARM MOTOR OVERLOADS

Cause:

The ATC system had two AC motors with braked function, and we had two motor-overload relays to protect these two motors.

Trouble shooting:

1. Check the Magazine-turret and the ARM motors' brake function are correct or magazine-turret and Arm's mechanical if they had any trouble.
2. Check the magazine-turret and Arm motors' cables & connectors if they had the short-circuited condition.
3. Check the magazine-turret and Arm's counting sensors if they are not working or damage, let's the motors keep turning and not to stop.

18. SPINDLE INDEX OVERTIMES

Cause:

When the CNC is executing the spindle index function is not finish inside 15 seconds.

Trouble shooting:

If you can't make the spindle index, please you check spindle belt or contact with the OEM manufacture.

20. ARM POSITION NOT READY OR SENSORS DAMAGED

Cause:

Normally the Arm position must stay on the home position. When the Arm not in position the CNC would launch this alarm message and inhibits the Z-axis movement only moving by the hand wheels function to protect safety operation.

Trouble shooting:

Check the sensors of the Arm to confirm correctly condition position.

Manual turning the Arm's motor-shift by the wrench to turning the Arm go back to the home position. Firstly release the motor brake function by push the brake released bat on the top position of the Arm's motor.

21. ARM CANN'T TURNING WHEN Z NOT AT TOOL CHANGE POSITION

Cause:

When the Arm is turning (T-changed) and the Z-axis position is not on the tool-changed position.

Trouble shooting:

To check the Z-axis position if it is not on the "Tool-changed" position. This tool-changed position value is memo on the "PLC Parameter (P18)", lets you to check.

22. ARM CANN'T TURNING WHEN SPINDLE NOT INDEX

Cause:

When the Arm (T-changed) is turning and the spindle index angel not on the tool-changed position.

Trouble shooting:

To execute the spindle orientation function by push the "Spindle Orientation" Key or executing the M18 function if the index angel is correct. This tool-changed index angel value is memo on the "PLC parameter (P19)", let's you to check. If you can't make the spindle index, please you check spindle belt or contact with OEM manufacture.

23. ARM CANN'T TURNING BEFORE POCKET DOWN

Cause:

When the arm is turning and the pocket of the tool magazine-turret is not down position for the arm to clamp tools in the tool magazine-turret.

Trouble shooting:

To execute the M-function (M83 : Tool-pocket down) to make the tool pocket down.

Check the magazine-position, pocket up/down sensors, air solenoids and air pressure if they are working correctly.

24. ARM CANN'T TURNING BEFORE Z REFERENCED

Cause:

When the arm is turning and the Z-axis is not finish the home return before tool changed function.

Trouble shooting:

To execute the home return (**G74**) function.

25. ARM CANN'T DOWN WHEN TOOL ISN'T UNCLAMPING

26. ARM CANN'T HOME WHEN TOOL ISN'T CLAMPING

Cause:

It means the tool changed procedure is step by step, the CNC detects some steps are not ready and launch these messages for different conditions.

Trouble shooting:

Following every one message to execute "M-Code" (**M10**, **M11**) functions to put the machine in the ready status and continue execute next procedure.

Check the limit switches, air solenoids and air pressure of the tool clamp devices if they are working correctly.

27. M71 ARM IN OVERTIMES

28. M72 ARM DOWN OVERTIMES

29. M73 ARM HOME OVERTIMES

Cause:

It means the tool-changed procedure, the arm is turning step by step, the CNC detects some steps are not ready and launch these messages for different conditions.

Trouble shooting:

Check the sensors of the Arm to confirm correctly condition position.

Check the limit switches, air solenoids and air pressure of the tool clamp devices if they are working correctly.

30. X-AXIS DRIVER ALARMS

31. Y-AXIS DRIVER ALARMS

32. Z-AXIS DRIVER ALARMS

33. A-AXIS DRIVER ALARMS

34. SPINDLE DRIVER ALARMS

Cause:

The FAGOR digital driver's system & servomotors (X, Y, Z, and S) had some errors or alarms.

Trouble shooting:

Check the driver's status, it would show checksum codes by the "8-Segment's Led Displayer" on the each driver. The lists of the errors and warning codes, you can reference to the "FAGOR Servo-Driver System Manual. In this manual has the troubleshooting and solution.

ALARMS MESSAGES:

1. NEED DO TOOL MAGAZINE HOME SEARCH BY M69

Cause:

The tool-changed is not finished by external E-Stop, CNC Errors, others alarms and make the Tool- changed failure. The Arm stop and the “Spindle Tool” and “Pocket Tool” had been to change but not finish completely. Under this condition, you must continue finish the tool-changed steps and did some troubleshooting function to let the CNC in the ready.

Trouble shooting:

To execute the magazine turret home return (**M69**).

2. X+ OVER TRAVEL LIMIT

3. X- OVER TRAVEL LIMIT

4. Y- OVER TRAVEL LIMIT

5. Y+ OVER TRAVEL LIMIT

6. Z- OVER TRAVEL LIMIT

7. Z+ OVER TRAVEL LIMIT

Cause:

When axes travel over soft limit and touch the limit switches. The CNC had limit the axes moving only in the right direction.

Trouble shooting:

Keep push “O.T” button and push “Control Ready” button, then moving the axes in the correctly direction into the safety travel area.

8. MAGAZINE-TURRET NOT IN POSITION

Cause:

When the tool magazine-turret is turning and in position, the magnetic position sensor isn't active, or tool magazine-turret counting sensor not in the correct position.

Trouble shooting:

Check the two magnetic sensors if they are ready or damage, and make sure the magazine turret counting sensor is ready and magazine-turret in the correct position.

9. DRIVER NOT READY

Cause:

The FAGOR digital driver's system & servomotors (X, Y, Z, and S) had some errors or alarms.

Trouble shooting:

Check the driver's status, it would show checksum codes by the “8-Segment's Led Displayer” on the each driver. The lists of the errors and warning codes, you can reference to the “FAGOR Servo-Driver System Manual. In this manual has the troubleshooting and solution.

10. DOOR OPEN CAN'T CYSTART (AUTO)

Cause:

The guard interlocks protection function. Under the automatic mode, must be close the guard.

1. During CNC in the executing-mode you need to press "Cycle Stop" key to stop the program, then the axes would "Feed Hold" and the spindle turning (push "Spindle Stop" key to stop spindle). After the spindle is zero speed, then push the "Door-Release" button to unlock the door interlock and can open the door. While the door is closes and the door-interlock would be lock the door again, You must push "Door-Release" button again to open door.
2. Under the "Door Open", CTS, coolant water; air blasting and chip-conveyor would immediate stop and spindle turning low speed rpm (P66).
3. While CNC executing "M00, M01, M02, M30" functions, the door interlock would be released automatic.

Trouble shooting:

Close the door guards, this message would be disappeared.

11. AIR PRESSURE LOW

Cause:

When the air pressure is lower than the 4Kg/cm^2 , this message will be appeared.

1. Under the manual-mode, the CNC can't execute any command and the key "Cycle Start" is no function (Inhibit).
2. During the CNC in the executing-mode, the CNC would change to the "Single-Block" mode and into the "Feed Hold" condition, waiting this alarm take out, then press "Cycle Start" key to restart the programs and the CNC functions.

Trouble shooting:

Check and make sure the air source pressure must larger than the 6Kg/cm^2 , is not lower than the 4Kg/cm^2 .

12. AXES LUBE. LOW-LEVEL

13. AXES LUBE. PRESSURE LOW ALARMS

Cause:

When the axes lubricated oil in the tank is lower than minimum-level,

1. Under the manual-mode, the CNC can't execute any command and the key "Cycle Start" is no function (Inhibit).
2. During CNC in the executing-mode, the CNC would change to the "Single-Block" mode and into the "Feed Hold" condition, waiting this alarm take out, then press "Cycle Start" key to restart the programs and the CNC functions.
3. Under the "Lubrication-low" condition happen 15 minutes; the CNC would go into the "Stop" condition.

Trouble shooting:

Add lubricate oil up to maximum-level.

14. COOLANT MOTOR OVERLOADS

20. WATER LEVEL LOW ALARMS

Cause:

The coolant pump motor is running over current and motor overload relay jump out the current range. The water of the coolant tank is too less and need to protect the coolant pump motor dry turning.

Trouble shooting:

1. Check the motor turning direction if it isn't in the correctly direction. (same as the arrow mark on the motor cover). If it is turning in the wrong direction, changed the main power lines (replaced two phase lines of the main power).
2. Check coolant water if it is not enough, let pump motor dry running.
3. Check the pump motor wiring cables & connectors if it had short-circuited.
4. Check the level-sensor of the water-tank if it's damaged.

15. C.T.S MOTOR OVERLOADS

19. RECYCLE MOTOR OVERLOADS

21. CTS WATER LEVEL LOW ALARMS

Cause:

The C.T.S or recycle pump motor are running over current and motor overload relay jump out the current range. The water of the C.T.S coolant tank is too less and need to protect the CTS pump motor dry turning.

Trouble shooting:

1. Check the motors turning direction if they are not in the correctly direction (same as the arrow mark on the motor cover). If they are turning in the wrong direction, changed the main power lines (replaced two phase lines of the main power).
2. Check the C.T.S pump system water if it is not enough, let pump motor dry running.
3. Check these pump motors wiring cables & connectors if they had short-circuited.
4. Check the level-sensors of the water-tank if it's damaged.
5. Check the recycle pump motor system, if it is work correctly.

16. SPLASH MOTOR OVERLOADS

Cause:

The splash pump is running over current and motor overload relay jump out the current range.

Trouble shooting:

1. Check the motor turning direction if it isn't in the correctly direction (same as the arrow mark on the motor cover). If it is turning in the wrong direction, changed the main power lines (replaced two phase lines of the main power).
2. Check coolant water if it is not enough, let pump motor dry running.
3. Check the pump motor wiring cables & connectors if it had short-circuited.

17. CHIP-CONVEYOR MOTOR OVERLOADS

Cause:

The chip-conveyor motor is running over current and motor overload relay jump out the current range.

Trouble shooting:

1. Check the motor turning direction if it isn't in the correctly direction (same as the arrow mark on the motor cover). If it is turning in the wrong direction, changed the main power lines (replaced two phase lines of the main power).
2. Check mechanical components of the chip conveyor if it had some troubles or chips in the conveyor are too much let motor can't run smoothly.
3. Check the chip conveyor motor wiring cable & connector if it had short-circuited.

18. SPINDLE CHILLER ALARMS

31. SPINDLE SERVO MOTOR FAN OVERLOADS

Cause:

The spindle oil cooling system or spindle motor fan is running trouble.

Troubleshooting:

Check the status on this spindle oil cooling system, if it had any alarm codes launch on the displayer. Refer to the manual of the cooling system, to get the trouble-shooting function for different conditions.

Check the spindle motor fan on the spindle motor rear side.

22. T-UNCLAMPING SPINDLE CAN'T TURNING

Cause:

It means the spindle tool-unclamping device isn't in the ready, the CNC detects alarms and launch this message.

Trouble shooting:

Check the limit switches, air solenoids and the air pressure of this tool unclamping device if they are working correctly.

Check mechanical components of the tool clamping device if it had some troubles.

Check the spindle mechanical clamping function if it had some troubles let tool clamping can't work correctly.

23. TOOL UN/CLAMPING SWITCHES LOST ALARMS

24. TOOL UN/CLAMPING SWITCHES BAD ALARMS

Cause:

It means the spindle tool-unclamping device is in the unready condition. The CNC detects the alarms, launches this message and inhibits the spindle turning or orientation.

Trouble shooting:

1. Check the limit switches of the tool-unclamping device if they are working correctly.
2. Check the signals of the tool Unclamping switches if they had the signals feedback to the CNC.

25. DOOR OPEN (COOLANT-OFF)

Cause:

Under door-open in the manual-mode, limits the axes federate and rapid feed inhibits, spindle speed, coolant pump is inhibited.

The axes feed speed can be limited by the "Axis Parameter (P75)" values independent.

The spindle speed can be limited by the "Spindle Parameter (P66)" values.

Troubleshooting:

Close the door guards, this message would be disappeared.

26. ARM NOT IN HOME POSITION

Cause:

Normally the Arm position must stay on the home position. When the Arm not in position the CNC would launch this alarm message and inhibits the Z-axis movement only moving by the hand wheels function to protect safety operation.

Trouble shooting:

Check the sensors of the Arm to confirm correctly condition position.

Manual turning the Arm's motor-shift by the wrench to turning the Arm go back to the home position. Firstly release the motor brake function by push the brake released bat on the top position of the Arm's motor.

27. ARM SERVICE MODE ENABLE

Cause:

The tool-changed is not finished by external E-Stop, CNC Errors, others alarms and make the Tool- changed failure. The Arm stop and the "Spindle Tool" and "Pocket Tool" had been to change but not finish completely. Under this condition, you must continue finish the tool changed steps and did some troubleshooting function to let the CNC in the ready.

Trouble shooting:

Firstly setup the "PLC Parameter No: 2 (P2 = 1)" of the CNC to enable trouble-shooting push-button for the "ARM jogging turning" or "Tool-un/clamping" function.

28. DRIVER POWER NOT READY (PUSH "Control Ready")

Cause:

The driver system and CNC in the ready status, waiting power supply to the "FAGOR Power-Supply". After the "FAGOR Power-Supply" system go into "BUS ON" status and green led on displayer, this message immediately disappeared.

Trouble shooting:

Push the "Control Ready" button on operator panel.

29. NO SPINDLE SPEED VALUE

Cause:

It means the spindle no speed command and you push the spindle "CW" or "CCW" keys or executing the "M3" or "M4" function to turning the spindle. The CNC detect alarms and launch these messages, then inhibit the spindle turning.

Troubleshooting:

Please you key in the spindle speed value and maximum speed to the CNC, then this alarm messages immediately disappeared and you can turning the spindle

30. SPINDLE SPEED ARRIVE FAIL

Cause:

While the CNC executing the "M3" or "M4" function to turning the spindle.

The CNC detect alarms and launch these messages, then inhibit the spindle turning.

Troubleshooting:

Check the spindle belt if it is loosening.

Check the spindle parameter (**P45**) for spindle motor accelerate timer.

32. HOME SEARCH NOT DONE

Cause:

When power on the machine every time, not make the machine home search.

Trouble shooting:

Executing the "Home Search" function and finished, this message would be disappear.

If you don't finish 3-axes reference return, the CNC would be inhibited the "Cycle Start" key.

If you need to use the "Cycle Start" key under the "Home Search Not Done" condition, setup the PLC parameter No: 10 (**P10 = 1**) of the CNC to enable "Cycle Start" key.

33. FEED HANDWHEEL FUNCTION ACTIVED

Cause :

Usually, the machine feed rate is controlled by means of the feed rate override switch.

Now, it's possible to use machine hand wheels to control that feed rate. This way, the machining feed rate will depend on the how fast the hand wheel is turned.

34. MAGAZINE IS HOMING

Cause:

When the CNC is executing the tool pockets home return (**M69**) function and launch this message.

35. MAGAZINE-TURRET POCKET DOWN

Cause:

The tool pockets not in the up position. The CNC launch this messages.

Trouble shooting:

To execute the M-function (**M82** : Tool -pocket up) to make the tool pocket up.

36. 4-AXIS (ROTARY TABLE) CLAMPING, INHIBIT TURNING

Cause:

It means the 4-th rotary table in clamping condition, can't turn 4-th rotary table.

Under the "Emergency" and "4-th clamping function", the CNC would be display this message.

Trouble shooting:

Execute the (**M26**) function to unclamping the rotary table, this clamping status would be released and this message would be disappeared.

How to make the Tool-Magazine Table Reorganized (M70) :

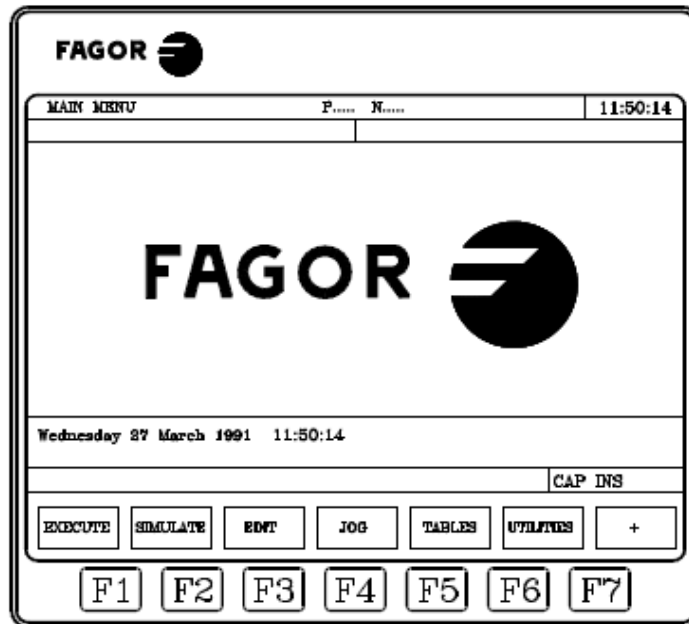
- 1. If the magazine-turret pocket is down, made the pocket up by the M82 function.**
- 2. Executed the M69 function to make the Magazine-turret return to the pocket 1 position automatic.**
- 3. Executed the M70 function to reorganize the Tool-Magazine Table.**
- 4. After the reorganization, the CNC active tool (Spindle Tool) is reserved the least tool and the magazine position number is the same as the tool number.**

How to set up the new Z-axis tool-changed position:

- 1. After fix the Z-axis servomotor, make the machine “Home Search”.**
- 2. Put the tool to spindle by the manual tool-unclamping push-button.**
- 3. Execute the spindle-orientation by push the “Spindle-Orientation” key on the CNC operation panel.**
- 4. Manual moving the Z-axis by the hand wheels function.**
- 5. Execute the magazine-pocket down (M83) by the MDI function.**
- 6. Released the ARM motor brake function by push the ARM motor brake released-bolt.**
- 7. Manual turning the ARM motor and the spindle let the fork of the ARM to catch the spindle tool.**
- 8. Write down this position value and enter this data to the “PLC Parameters (P18)” of the CNC.**
- 9. Push the “Shift”+ ”Reset” keys to restart the CNC, make this parameter value validate and put air to the machine.**

How to set up the new spindle-index tool-changed position:

1. Changed the CNC operating mode to the 8055-i mode by push the “SHIFT” + the “ESC” keys.

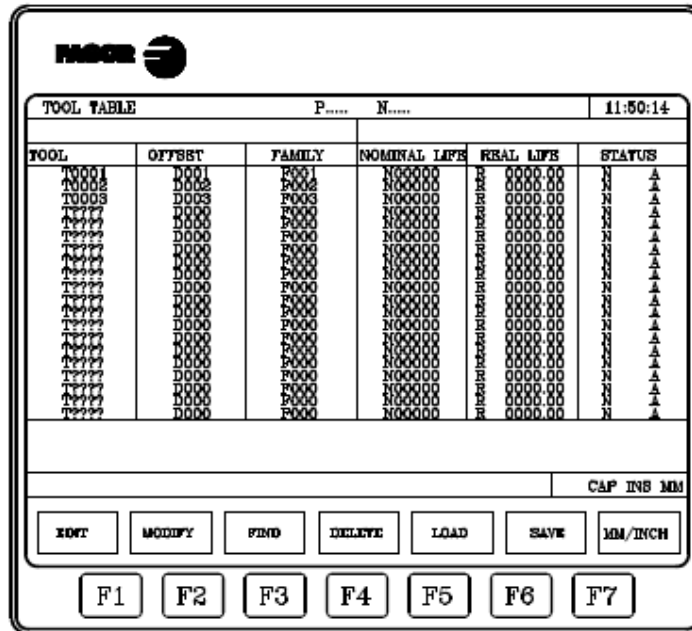


2. Press the “Jog” key , it displays next screen.
3. Press the “Display Function” key, it displays next screen.
4. Press the “USER” key, it displays small window on the main screen.
5. Executing the spindle-orientation by push the “Spindle-Orientation” key on the CNC operation panel.
6. This user window would display the spindle angel in time.
7. Write down this angel position and enter this data to the “PLC Parameters (P19)” of the CNC.
8. Push the “Shift”+ “Reset” keys to restart the CNC, make this parameter value validate.

How to use the Special-Tools:

(Which occupy more than one magazine pocket)

1. Changed the CNC operating mode to the 8055-M mode by push the “SHIFT” + the “ESC” keys.
2. Press the “Tables” key , it displays next screen.
3. Press the “Tool Table” key, it would display the tool table screen.



4. Each tool has the following data fields :
 - Offset number associated with the tool
 - Family Code :

Family code.

It will be used when having an automatic tool changer and it will allow replacing the worn out tool with another one with similar characteristics.

There are two types of families:

- * Those for normal tools whose codes are between 0 and 199.
- * Those for special tools (which occupy more than one magazine pocket), whose numbers are between 200 and 255.

5. Modify the magazine position tool number with special tools.
6. Modify this special tool neighbor pockets to the empty pocket.
7. The special tools changed mode is non-random.

The “ARM-Type” tool-changed procedure :

Key in the “T-Codes”, and push the “Cycle Start” to choice the “Next Tool” in the magazine-turret. If the tool pocket is down, it would do the tool pocket up automatic.

The “Next Tool” pocket would move to the ready position.

Key in the “M06” then push the “Cycle Start”, or push the M06 button the CNC is automatic executing this procedure (See below):

The Z-axis going to the Tool-change Position ----->

Spindle Orientation ----->

The Tool Pocket Down ----->

The ARM turning to the step1 position (Catch the spindle tool) ----->

The Spindle Tool Unclamping ----->

The ARM turning to the step2 position (Tool change) ----->

The Spindle Tool Clamping ----->

The ARM turning to the step3 position (Home Position) ----->

The Tool Pocket Up

The lists of the PLC-Parameters to Setup different operating mode

Please change the CNC operating mode to **ISO-Mode** (8055M-Mode) by push the **SHIFT+ESC** keys, then to find the **Machine Parameters** function tables.

The PLC Parameter is belonged to the Machine Parameter group.

The CNC PLC Parameters: **P2**

P2 = 0 (Default Value)

P2 = 1

It's to enable troubleshooting function of the "Tool-Change" troubles.

The push buttons (Trouble-Shooting) on the secondary panel are to enable their functions.

The CNC PLC Parameters: **P3**

P3 = 0 (Default Value)

The machine had not installed the 4-th axis (Rotary Table) function.

P3 = 1 ; GOLDEN SUN Rotary Table

It's to set up the 4-th axis (Rotary Table) function to the machine.

To connect the "BUSS Cable" of the FAGOR driver (4-axis) and to enable driver's function.

P3 = 2 ; TANSHIN Rotary Table

It's to set up the 4-th axis (Rotary Table) function to the machine.

To connect the "BUSS Cable" of the FAGOR driver (4-axis) and to enable driver's function.

The CNC PLC Parameters: **P4**

P4 = 0 (Default Value)

The machine had not installed the screw-type chip-conveyor function.

P4 = 1

It's to enable the screw-type chip-conveyor function on the CNC.

The CNC PLC Parameters: **P5**

P5 = 0 (Default Value)

The machine had not installed the C.T.S coolant function.

P5 = 1

It's to enable the C.T.S coolant function on the CNC.

The CNC PLC Parameters: **P6**

P6 = 0 (Default Value)

The axes lubrication unit had own timer to control lubrication pump function.

P6 = 1

The axes lubrication control is need the PLC timers to control lubrication pump function.

The CNC PLC Parameters: **P7**

P7 = 0 (Default Value)

The CNC enable the spindle speed limit and axes feed limit under the door open.

P7 = 1

It's to disable the spindle speed limit and axes feed limit function.

The CNC PLC Parameters: **P10**

P10 = 0 (Default Value)

The Home Search function must be done after the machine power-on.

If you don't finish the Home Search function, the Cycle Start key is inhibited and the CNC can't execute M, S, and T functions.

P10 = 1

After the machine power is turn-on, not making the HOME SEARCH function, but you want to execute M, S and T functions.

The CNC PLC Parameters: **P11, P12**

The two PLC timers to control axes lubricated pump function.

P11 = 15 (Seconds): The Lubricated Pump Turning Period.

P12 = 30 (Minutes): Deactivate The Lubricated Pump Turning Period.

For examples:

While the machine is executing part-program, you can control axes lubricated pump function by the PLC timers. While the machines go into AUTO mode, the lubricated pump would be automatic turning 15 seconds (**P11**) per 30 minutes (**P12**).

The CNC PLC Parameters: **P13, P14, P15 (optional)**

P13, 14, 15 = 0 (Default Value)

The three PLC timers to control chip-conveyor function under the AUTO mode.

P13 = 30 (Minutes): Deactivate the chip-conveyor motor turning period.

P14 = 05 (Minutes): The chip-conveyor motor CW. turning period.

P15 = 30 (Minutes): Delay the chip-conveyor motor turning period.

For examples:

While the machine is executing part-program, you can control chip-screw motor CW. Function by the PLC timers. While the machines go into AUTO mode, the chip-screw motor would be delay 30 minutes (**P15**) then automatic turning 5 minutes (**P14**) per 30 minutes (**P13**).

The CNC PLC Parameters: **P16, P17**

The two PLC timers to control the recycle pump function.

P16 = 30 (Seconds) : The Recycle Pump Turning Period.

P17 = 15 (Seconds) : Deactivate The Recycle Pump Turning Period.

For examples:

While the machine is executing the C.T.S coolant function, the CNC can control recycle pump function by the PLC timers. The timers control the water level avoid the water in the C.T.S tank too less. While the machines running the C.T.S function, the recycle pump would be automatic turning 30 seconds (**P16**) per 15 seconds (**P17**).

The CNC PLC Parameters: **P18** (Plus or Minus Values)

The Z-axis Position of the Tool-Changed function is referent to the Home-reference position.

After this parameter is setup values, you must push the SHIFT+ RESET keys to restart the CNC and validate this parameter values.

The CNC PLC Parameters: **P19** (Plus or Minus Values)

The Index-Angel of the main spindle orientates.

When push the Spindle Orientation key or executing the Tool-Changed function.

After this parameter is setup values, you must push the SHIFT+ RESET keys to restart the CNC and validate this parameter values.

M-Codes Function Table for FAGOR 8055MC

M00	Program Stop
M01	Optional Program Stop
M02	Program End
M03	Spindle CW
M04	Spindle CCW
M05	Spindle Stop
M06	Tool Change
M07	C.T.S Coolant On
M08	Coolant On
M09	M7,M8,M51 Off
M10	Spindle Tool Clamping
M11	Spindle Tool Unclamping
M19	Spindle Orientation
M25	4-axis Rotary Table Clamping (Optional)
M26	4-axis Rotary Table Unclamping (Optional)
M30	Program End
M45	Chip-Screw CW (Optional)
M46	Chip-Conveyor & Chip-Wash Pump Off (Optional)
M47	Chip-Wash Pump On (Optional)
M51	Table Air Blasting On
M63	Active Tool Search
M64	Special Tool Search
M65	Next Tool Search
M69	Tool Magazine Home Return
M70	Tool Magazine Table Reorganize
M71	Arm Turning To Clamping Position
M72	Arm Turning To Unclamping Position
M73	Arm Turning To Home Position
M82	Tool-Pocket Up
M83	Tool-Pocket Down

The address position of the PLC Inputs/Outputs :

STANDARD MODULE (X2)

INPUTS : I1-I16

Input No.	Address	Symbols	Description
I01	(10)	I_EMERGEN-PB	EMERGENCY STOP PB.
I02	(29)	I_M01STOP-PB	M01STOP FUNCTION PB.
I03	(11)	I_BLKSKIP-PB	BLOCK SKIP1 FUNCTION PB.
I04	(30)	DOOR_UN-PB	DOOR-UNLOCK PB.
I05	(12)	I_APF-PB	M30 AUTO POWER ON PB.
I06	(31)	I_F1-PB	T-CHANGED TROUBLE-SHOOTING PB.
I07	(13)	I_COOL-PB	MANUAL COOLANT PB.
I08	(32)	MAG_CW-PB	MANUAL MAG. CW. PB.
I09	(14)	MAG_CCW-PB	MANUAL MAG. CCW. PB.
I10	(33)	I_M06-PB	T-CHANGED TROUBLE-SHOOTING PB.
I11	(15)	I_AIR-PB	TABLE AIR BLASTING PB.
I12	(34)	I_CTS-PB	MANUAL CTS COOLANT PB.
I13	(16)	4TH_UNCL-PB	MANUAL 4TH UNCLAMPING FUNCTION PB.
I14	(35)	CHIP_CW-PB	SCREW-CHIP MOTOR CW. PB.
I15	(17)	CHIP_CCW-PB	SCREW-CHIP MOTOR CCW. PB.
I16	(36)	I_SPLASH-PB	MANUAL SPLASH PUMP PB.

OUTPUTS : O1-O8

Output No.	Address	Symbols	Description
O01	(02)	O_EMERGEN	EMERGENCY STOP OUTPUT
O02	(21)	X_HOME-LED	X-AXIS HOME LED
O03	(03)	Y_HOME-LED	Y-AXIS HOME LED
O04	(22)	Z_HOME-LED	Z-AXIS HOME LED
O05	(04)	LUBE_AL-LED	AXD LUBE. ALARMS LED
O06	(23)	M01STOP-LED	M01STOP FUNCTION LED
O07	(05)	BLKSKIP-LED	BLOCK SKIP FUNCTION LED
O08	(24)	O_APF-LED	M30 AUTO POWER-OFF FUNCTION LED

STANDARD MODULE (X9)

INPUTS : I65-I104

Input No.	Address	Symbols	Description
I65	(02)	X_OT-LS	X-AXIS OVER-TRAVEL LS
I66	(21)	Y_OT-LS	Y-AXIS OVER-TRAVEL LS
I67	(03)	Z_OT-LS	Z-AXIS OVER-TRAVEL LS
I68	(22)	X_HOME-LS	X-REFERENCE LS
I69	(04)	Y_HOME-LS	Y-REFERENCE LS
I70	(23)	Z_HOME-LS	Z-REFERENCE LS
I71	(05)	I_CHILLER-AL	SPINDLE CHILLER ALARMS (NC)
I72	(24)	4_HOME-LS	4-REFERENCE LS
I73	(06)	4_CL-LS	4-AXIS CLAMP LS
I74	(25)	4_UNCL-LS	4-AXIS UNCLAMP LS
I75	(07)	DOOR_CL-LS	DOOR INTERLOCK LS
I76	(26)	AIR_LOW-S	AIR PRESSURE LOW SIGNAL (NO)
I77	(08)	LUBE_LOW-S	LUBE.-LOW LEVEL SIGNAL (NO)
I78	(27)	I_SFAN-OL	SPINDLE SERVO MOTOR FAN OVERLOADS
I79	(09)	SPD_HOME-S	SPD-REFERENCE SENSOR
I80	(28)	T_UNCL-PB	TOOL UNCLAMP PB.(NO)
I81	(10)	T_UNCL-LS	LS_TOOL-UNCLAMP (NO)
I82	(29)	T_CL-LS	LS_TOOL-CLAMP (NO)
I83	(11)	MAG_C-S	MAG_COUNTER SENSOR (NO)
I84	(30)	MAG_H-S	MAG_HOME SENSOR
I85	(12)	POT_UP-S	MAG-POCKET UP SENSOR (NO)
I86	(31)	POT_DOWN-S	(MAG-POCKET DOWN SENSOR (NO)
I87	(13)	ARM_H-S	ARM HOME SENSOR
I88	(32)	ARM_C-S	ARM CLAMPING SENSOR
I89	(14)	ARM_S-S	ARM STOP SENSOR
I90	(33)	I_ARM-OL	ARM MOTOR OVERLOADS
I91	(15)	I_MAG-OL	MAGAZINE MOTOR OVERLOADS (NO)
I92	(34)	I_COOL-OL	COOLANT OVERLOADS (NO)
I93	(16)	I_SPLASH-OL	SPLASH MOTOR OVERLOADS
I94	(35)	I_CHIP-OL	CHIP-CONVEYOR MOTOR OVERLOADS
I95	(17)	I_CTS-OL	CTS MOTOR OVERLOADS (NO)
I96	(36)	CTS_PRS-S	CTS FILTER PRESSURE ALARMS (NO)
I97	(14)	MPG_X-SW	X AXIS MPG
I98	(33)	MPG_Y-SW	X AXIS MPG
I99	(15)	MPG_Z-SW	X AXIS MPG
I100	(34)	MPG_4-SW	X AXIS MPG
I101	(16)	POWER_OK-S	MAIN POWER OK SIGNAL (NO)
I102	(35)	MPG_10-SW	MPG *10
I103	(17)	MPG_100-SW	MPG *100
I104	(36)	I_WL-PB	MANUAL WORK LAMP ON PB.

STANDARD MODULE (X7)

OUTPUTS : O33-O56

Output No.	Address	Symbols	Description
O33	(02)	O_OFF-DELAY	DRVER POWER DELAY OFF
O34	(21)	O_AXD-ENABLE	AXES DRIVER ENABLE
O35	(03)	O_SPD-ENABLE	SPINDLE DRIVER ENABLE
O36	(22)	AIR_AL-LED	AIR PRESSURE LOW ALARMS LED
O37	(04)	O_WORK-LAMP	WORK LAMP ON
O38	(23)	O_AUTO-OFF	M30 AUTO-POWER OFF SOL.
O39	(05)	O_COOLANT	COOLANT MOTOR ON (AC24V)
O40	(24)	O_MAG-CW	MAG. MOTOR CW TURNING (AC24V)
O41	(06)	O_MAG-CCW	MAG. MOTOR CCW TURNING (AC24V)
O42	(25)	O_ARM-CCW	ARM MOTOR CW TURNING
O43	(07)	O_CTS	CTS COOLANT MOTOR TURNING
O44	(26)	O_DOOR-UN	DOOR INTERLOCK RELEASE (DC24V)
O45	(08)	O_CHIP-CW	CHIP-CONVEYOR MOTOR CW TURNING
O46	(27)	O_CHIP-CW	CHIP-CONVEYOR MOTOR CCW TURNING
O47	(09)	O_SPLASH	SPLASH MOTOR TURNING
O48	(28)	O_G-LAMP	CNC IN-EXECUTION FUNCTION LAMP
O49	(10)	POT_UP-SOL	POCKET UP_SOL.
O50	(29)	POT_DOWN-SOL	POCKET DOWN_SOL.
O51	(11)	T_UNCL-SOL	TOOL-UNCLAMP_SOL.
O52	(30)	T_AIR-SOL	TABLE BLASTING AIR_SOL.
O53	(12)	4_CL-SOL	4-th CLAMPING SOL.
O54	(31)	CNC_AL-LED	ALARM OR ERRORS LAMP (R)
O55	(13)	O_Z-BRAKE	Z-AXIS BRAKE SOL.
O56	(32)	O_Y-LAMP	M-CODES FUNCTION LAMP (Y)



M01 Function Key with the LED



Block Skip1 Function Key with the LED



M30 Auto Power-Off Function Key with the LED



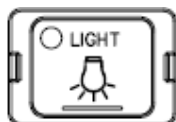
Manual Work Pieces Air Blasting Function Key with the LED



Manual Coolant Pump Function Key with the LED



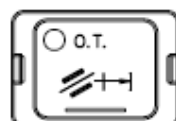
Manual C.T.S Coolant Pump Function Key with the LED



Manual Work Lamp Function Key with the LED



Manual Door Interlock Released Function Key with the LED



Over Travel Released Function Key with the LED



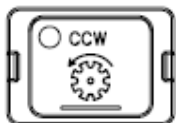
Control & Servo Power Ready Function Key with the LED



Manual Tool-Changed Trouble Shooting Function Key with the LED



Manual Tool-Changed For Arm-Type Function Key with the LED



Manual Magazine-Turret CW, CCW Turning Function Key with the LED



Manual Chip-Conveyor CW, CCW Turning Function Key with the LED



Manual Splash Pump Function Key with the LED



Manual the 4th-Axis Un clamping Function Key with the LED



The Axes Home Search or Home Position Pilot LEDs



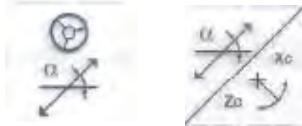
The Axes Lubrication System Oil-Low or Oil Pressure-Low Alarms LED



The CNC Alarms LED



The Air Source Pressure-Low Alarms LED



The Path Hand Wheel (Linear, Arc) Function Key



The Feed Hand Wheel Function Key



The manual activate the Lube. Pump key.