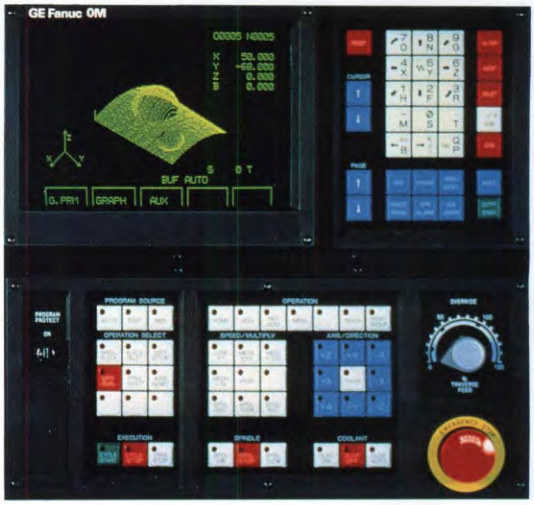
Series O-MA
Computer Numerical Control

The Series O-MA Computer Numerical Control is a low-cost, high-performance CNC designed for small machining centers, milling machines and drilling machines. The O-MA is a compact control and has GE Fanuc quality, which has been approved by more than 100,000 users all over the world.



Features

- Conversational Programming
- Graphic Display
- Absolute Position Detection
- Look Ahead Cutter Radius Compensation
- Drill/Bore Canned Cyles
- Multi-Language Display
- Built-in PMC
- Custom Macro

Conversational Programming with Graphic Function (optional)

With this optional feature, the O-MA's graphic explanations of command data and program menus are displayed on the CRT to aid in programming. The operator is guided, step-by-step, along the correct procedural path for set-up, cycling, programming and editing. Five soft keys arranged below the screen and the soft key menus displayed are also of great assistance to the operator.

High Performance High Productivity

Extensive use of high-speed microprocessors and many custom LSIs in the control circuit has drastically reduced the number of circuit elements, and only one digital logic circuit board is used for the control section.

A highly efficient power supply has been employed to reduce heat generation. The sheet-key switches for the NC operator's panel incorporate a special rubber sheet for dust- and drip-proofing. The sheet covering the keys is provided with finger-rests over each switch for tactile assistance in operation. Key operation is also facilitated by a large switch stroke and a crisp snapback touch. And even if a drift in the servo loop occurs, it is automatically compensated to maintain accurate positioning. Furthermore, very careful selection of components and very extensive performance tests before shipment ensure long-lasting, trouble-free operation.

Part Program Storage and Editing

- Stores part programs and subprograms in the memory. Capacity: 33 ft (10m) of tape information as standard and max. 393 ft (120m) as option.
- Allows tapeless operation with the part program stored in the memory, and by calling the stored subprogram as required.
- Searches, deletes, and corrects stored words or blocks and inserts new words.
- Searches and deletes part programs stored in the memory.
- Operates the machine by the corrected part program.
- By connecting GE Fanuc PPR or floppy cassette, programs can be input and output. (option)

This simplifies and speeds up program debugging. The trouble of setting or changing the NC tape is eliminated. The part program stored in the memory can be quickly modified to machine under the most suitable cutting condition.

Specifications

Graphic Display (optional)

Prior to actual machining, programming accuracy can be checked by displaying the programmed tool path in graphic form on the CRT screen. It is also possible to describe the tool path on the screen during actual machining so the operator can easily keep track of machining progress.

Pattern Data Input (optional)

By inputing necessary dimensions, a pattern can be machined. This is very useful to the machine which produces small batch, similar shape or limited variety workpieces.

Custom Macro (optional)

With custom macro (body) the user can program, store, recall and execute his own automatic cycles, family programs, etc. In other words, the user or machine tool builder creates his own software, thereby permitting unique software designed to match the needs of the given NC machine tool, for enhanced functional expandability and individually tailored work capacity.

- Variables can be used.
- Inter-variable calculations (add/subt/mult/div, trigonometry, binary/decimal transformations, etc.) are possible.
- Branching is possible.

Multi-Language Display (optional)

All messages can be displayed on the CRT in a choice of languages including Japanese, English, German and French. Each message is precise and easy to understand.

Canned Cycle (optional)

Available are 12 different kinds of canned cycles for drilling, tapping and boring. Unique to the Series O-MA are High Speed Peck Drilling Cycle, Fine Boring Cycle (including spindle orientation), and Back Boring Cycle.

Cutter Compensation (G40-42, optional)

Cutter compensation using crosspoint calculation method is available for all lines and circles. Since the cutter compensation is possible even for inner corners, calculation during programming is much simplified. Up to 99 pcs of cutter compensation can be accommodated.

Built-in PMC (Programmable Machine Controller)

There are two types of PMCs available. The PMC Model L is for relatively simple applications and uses the same CPU as the NC. The PMC Model M is for more complex applications and has its own CPU. Both models use the most popular ladder-oriented PMC language. By using the PMC it is possible to incorporate your own special functions.

	Model L	Model M
Calculation speed	30μs/step	6μs/step
Max. Program	3000 step	5000 step
Max. Input	104	208
Max. Output	72	144

Fully Electronic Absolute Position Detector (optional)

The AC servo motor features a built-in fully electronic absolute detector which retains the specified machine coordinates even if power to the CNC is turned off. This greatly simplifies operation by eliminating the need to carry out zero return normally required when power is turned on.

The absolute position detector is fully electronic and uses no gears or other mechanical components. The result is extremely high reliability with no problems relating to wear, etc.

Tool Length Measurement (optional)

By aligning each tool against the fixed point on the machine and pushing the input button, tool length compensation values for each tool can be set.

Specifications—Basic Functions

Controlled axes - 3 axes X, Y, Z	Tool length compensation (G43, G44, G49)
Simultaneous controllable axes - 2 axes	Tool offset amount memory-32, ± 6 digits
Interpolation unit	Backlash compensation-Max. 255 pulses
Max. programmable dimension ± 7 digits	Servo off-PMC required
Positioning	Cycle start/Feed hold
Linear interpolation	Buffer register
Multi-quadrant circular interpolation	Program stop/Program end (M00/M01/M02/M30)
Rapid traverse rate (24 m/min. max.)	Reset
Feedrate command	Manual continuous feed
Feedrate range (15 m/min. max.)	Incremental feed (X1, X10, X100, X1000)
Tangential constant speed control	Manual absolute on/off-PMC required
Feedrate override (0 - 150% (10% increments))	Machine lock (all axes)
Rapid traverse override-Fo, 25, 50, 100%	Auxiliary functions lock-PMC required
Override cancel-PMC required	Z-axis command cancel-PMC required
Automatic acceleration/deceleration	Dry run
Exact stop-G04	Single block
Dwell (G04)	Mirror image-X, Y, 4th axes-PMC required
Reference point return-manual, automatic (G27, G28, G29)	CRT/MDI-9" monochrome
Second reference point return-PMC required	Part program storage & editing
Coordinate system setting (G92)	Registerable programs-63
Automatic coordinate system setting	Tape storage length (CMOS memory, 10m)
Absolute/incremental command	Data protect key - 1
Decimal point input/Pocket calculator type decimal point input	Self diagnosis function
S code output-BCD 2 digits	Emergency stop
T code output-BCD 2 digits; 4 digits possible with PMC	Stored stroke check 1
M code-BCD 2 digits	Interlock, each of axes-PMC required
Program number display-4 digits	Status output-CNC ready, Servo ready, Alarm, Distribution end, Automatic operation, Automatic operation start lamp, Feed hold, Reset
Program number search	Power supply: AC200V + 10%,-15%, 50/60Hz + 1Hz or AC220V + 10%,-15%, 50/60Hz + 1Hz
Sequence number display-4 digits	Connectable servo motor-DC, AC servo motor, etc.
Sequence number search	Connectable servo unit-PWM DC, AC servo drive, etc.
External work number search-15 groups	Connectable position detector-Absolute Encoder, Incremental Encoder, Optical scale
Main program/Subprogram-Subprogram: 2 holds nested	Connectable spindle motor-AC spindle motor, etc.
Program format-word address format	Connectable spindle servo unit-AC spindle drive, etc.
Label skip	Cabinet Type-Panel mount type
Control in/out	
Optional block skip	
Skip function (G31)	

Specifications - Optional Functions

PMC Model L: 3,000 steps - DI:104, DO:72 Max.	Additional offset memory A-Total: 64
PMC Model M: 5,000 steps-DI:208, DO:144 Max.	Additional offset memory B-Total: 99
Additional axis control	Cutter compensation B
Simultaneous 3-axis control	Cutter compensation C
Jog override-PMC required	Tool length measurement
Tape storage length-Max. 120 m (393 ft), 80 m (262 ft), 40 m (132 ft), 20 m (66 ft)	External tool compensation-PMC required
Manual pulse generator-Max. 3 units: X1, X10, XM	Custom macro
Handle interruption-PMC required	Order-made macro
Mechanical handle feed	Run hour/No. of parts display
Stored pitch-error compensation	Graphic display
Software operator's panel-PMC required	Japanese display
All-purpose switch for software operator's panel-PMC required	German/French display
Program input of offset amount (G10)	Addition of registerable programs-Total: 125
Inch/metric conversion	Playback
Spindle analog output-S4/S5 digit command	Reader/punch interface
Spindle speed override-50 ~ 120%,-PMC required	Tape reader
Second auxiliary function-B3/B6 digits-PMC required	Power input unit A-External power ON/OFF
Canned cycles for drilling	Bubble cassette and adapter
Conversational programming with graphic function	Floppy cassette and adapter
Menu programming	Portable tape reader
Pattern data input	GE Fanuc PPR
	Machine operator's panel-PMC required

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