Advanced new standard for Mitsubishi CNC

MITSUBISHI CNC 70 Series

Dramatically reduced cycle time, while retaining high-accuracy and high-speed

- 10-nanometer scale interpolation facilitates high-accuracy machining
- High-speed synchronous tapping helps reduce machining time
- High-speed spindle orientation shortens ATC time
- "Rapid traverse constant inclination multi-step acceleration/deceleration" function helps minimize positioning time

Shortened setup time with easy operability

- Users' operations aggregated into 3 screens, "Operation", "Setup" and "Edit"
- Pop-up windows free you from screen transitions
- Guidance on operation, program and alarm gives assistance when necessary
- Equipped with simple programming functions "NAVI MILL" and "NAVI LATHE"

Versatile functions installed in a compact unit

- CNC unit mounted on the back of display realizes compact integration
- Highly visible TFT colour LCDs, 8.4-inch and 10.4-inch types
- Memory card interface and 10BASE-T/100BASE-T Ethernet can simplify data management

MITSUBISHI CNC 70 TypeA

MITSUBISHI CNC 70 TypeB

High-speed PLC engine installed

Max. num of control axes: 11
Max. num of simultaneous contour control axes: 4
Least input/command increment: 0.1 micrometer
Least control increment: 10 nanometer
Max. PLC program capacity: 32000 steps

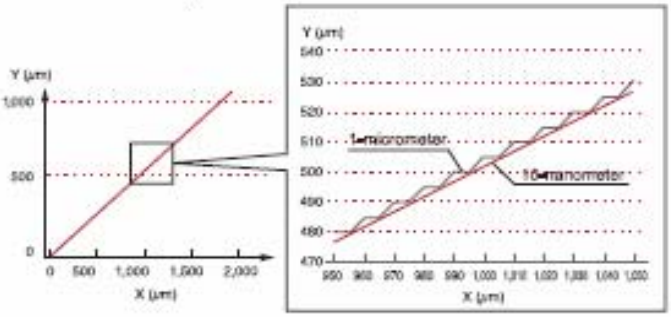
Max. num of control axes: 9
Max. num of simultaneous contour control axes: 4
Least input/command increment: 0.1 micrometer
Least control increment: 10 nanometer
Max. PLC program capacity: 20000 steps

High Precision

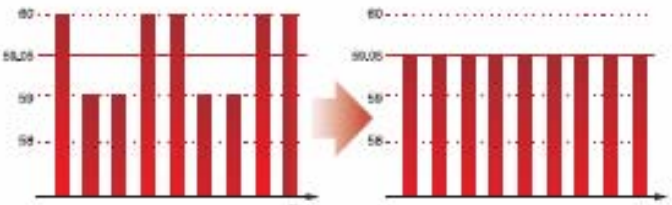
Higher-grade machining attained

10-nanometer interpolation control

- Even if machining program uses micron-unit commands, interpolation is performed in 10-nanometer unit, providing more accurate machining results.



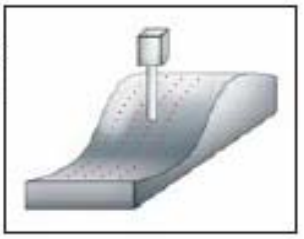
- Minute speed control suppresses speed fluctuations, which allows smoother machining surface.



<Speed command in 1-micrometer> <Speed command in 10-nanometer>

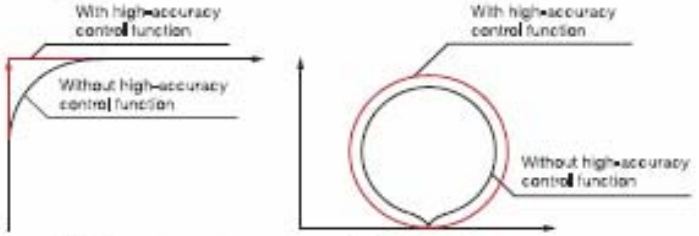
High-speed machining mode

- By reading ahead some blocks in a program that contains successive fine travel distances, the program can be rapidly executed at up to 33,000 blocks/minute. (supported by 70 TypeA)



High-accuracy control function

- At a corner that consists of straight lines, sharp interpolation control is performed to follow the commanded path by correcting curvature.
- Inward deviation error in arc motion is reduced to further accurately follow the command values.



<Curvature at a corner> <Error in arc motion>

Support for accurate turning machining

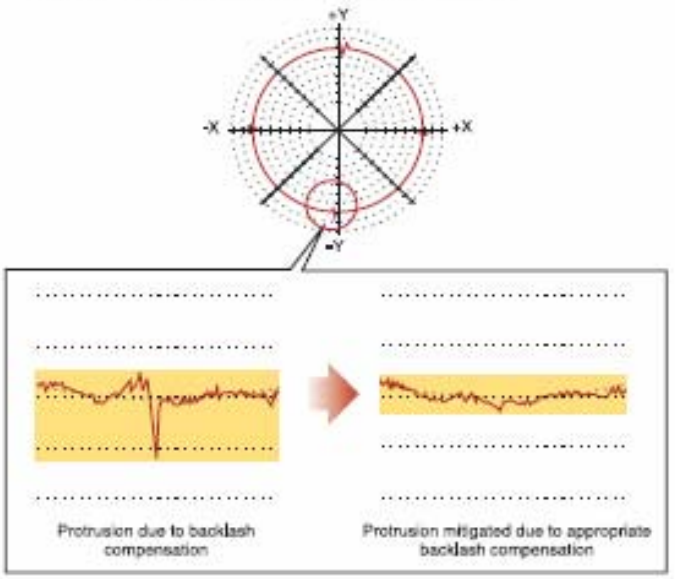
- Supports a wide variety of machines by offering control with up to 2 part-systems and 11 axes (up to 7 NC axes, 3 spindles and 4 PLC axes).
- 10-nanometer interpolation contributes to higher-accuracy in Y-axis machining and constant surface speed control.

In milling on Y-Z plane using inclined Y-axis, travel in X-axis direction is reduced when the Y-axis is traveling.

Accuracy of taper machining at constant surface speed is further improved due to faster internal arithmetic control and 10-nanometer interpolation control.

Gradually increasing-type backlash compensation

- Protrusion is reduced by gradually changing the backlash compensation amount according to the reversal of axis travel direction, which enables higher-accuracy machining.

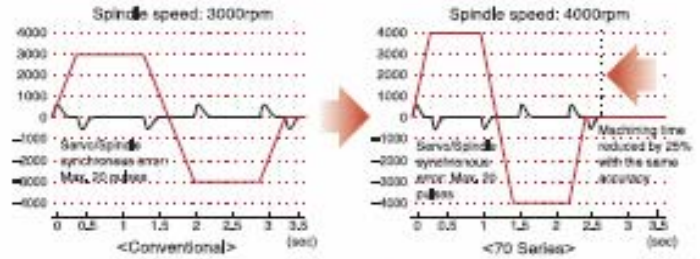


Productivity

Tact time thoroughly reduced

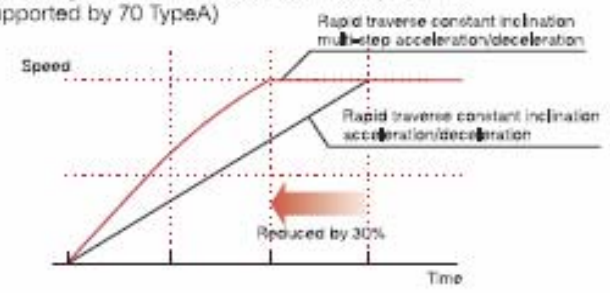
High-speed synchronous tapping function <OMR-DD>

●High-speed error compensation function adopted for spindle and servo control enables high-speed and high-accuracy tapping.



Rapid traverse constant inclination multi-step acceleration/deceleration function

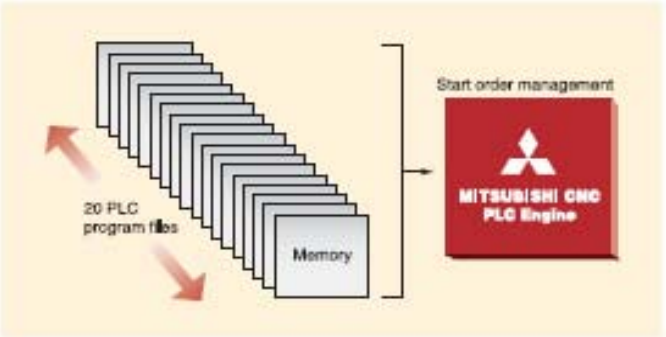
●Rapid traverse acceleration/deceleration is suitably controlled to meet motor's torque characteristic. As this function enables making the most of each motor's capability, you can reduce positioning time, which leads to shorter cycle time. (supported by 70 TypeA)



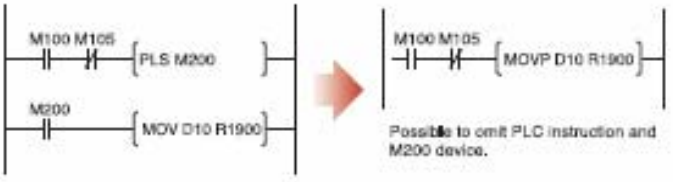
High-speed PLC engine

●Compared with the conventional model (60S Series), scan time has been reduced to one fourth, which helps shorten tact time. (supported by 70 TypeA)

●Up to 20 PLC program files can be registered, which are executed according to the priority.

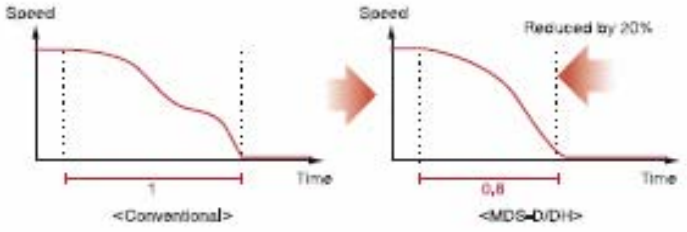


●To the function instructions, a new type of instruction has been added, which is executed only at condition's rise. With this instruction, there is no need to create a pulse.



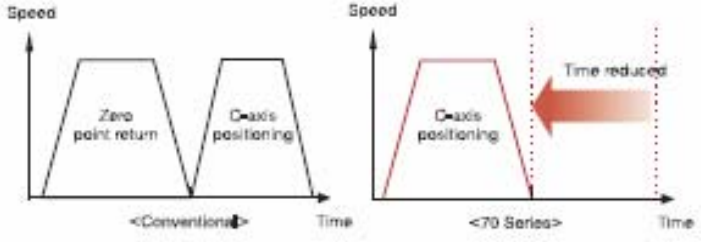
High-speed spindle orientation

●The maximum torque deceleration is enabled without being influenced by load inertia, which allows spindle orientation always in the shortest time.



Spindle/C-axis control

●Spindle's constant position loop control has eliminated zero point return time at switching from spindle to C-axis.



User Friendly

Simple programming functions, “NAVI MILL” and “NAVI LATHE”

By selecting machining process and inputting data on screen, you can automatically create programs for each process.
Also the cutting condition for each process can be automatically determined based on priorly registered tool files and cutting condition files.

Simple machining menu

●NAVI MILL machining pattern example (for machining center)


Boring


Facing


Contouring

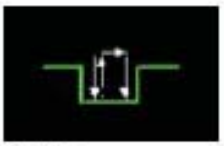

Pocketing

EIA

●NAVI LATHE machining pattern example (for lathe)


Turning


Copying


Grooving


Trapezoid grooving


Threading


Boring

EIA

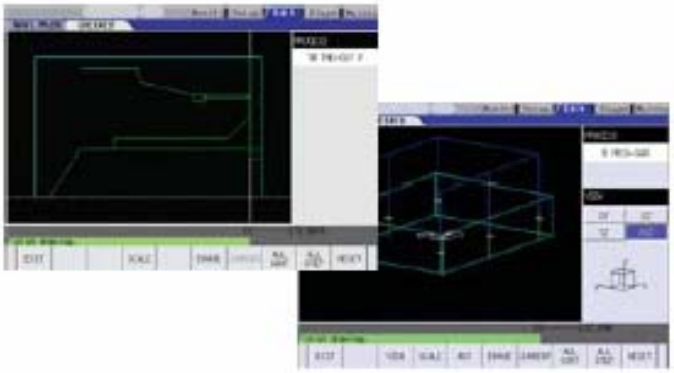

Holing by milling


Key way


Contouring

Checker

●Tool path and machining shape of a program are drawn as graphics, which helps you detect input errors at an early stage.



Overviewable interface design

●Operation screen consists of LIST VIEW and OPERATION VIEW.
●LIST VIEW shows objects such as programs, processes, file data, parameters, etc.
●OPERATION VIEW shows the items corresponding to the object that is being selected on LIST VIEW.
●Process copying, moving and deleting functions as well as input guidance screen help you create programs.

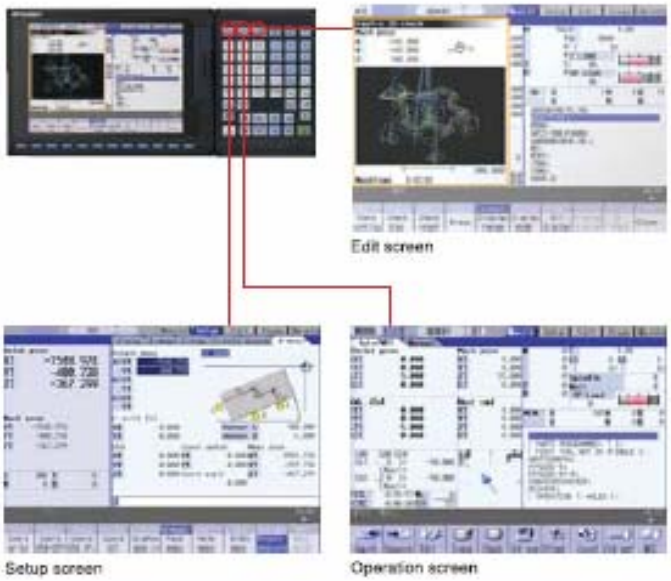
Customization of machining programs

●Possible to add a command between processes from Edit screen.
●Machine tool builders can customize the macro programs of each process.

Enhanced operability with greater ease of use

"Operation", "Setup" and "Edit" screens

●Necessary information is aggregated into 3 screens, "Operation", "Setup" and "Edit", which has been developed based upon a concept of easier and visible interface.



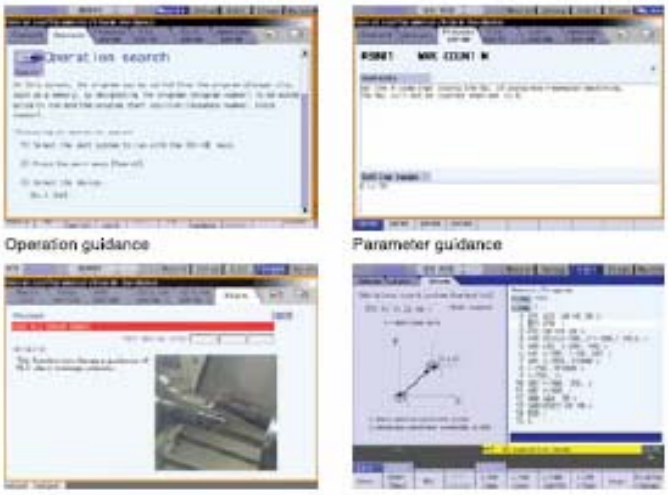
Edit screen

Setup screen

Operation screen

Operation-supporting guidance function

●Help button leads you to guidance on operation, parameter or alarm. You can also create a guidance screen that shows images. Edit screen shows the command format of the G code contained in a block you are editing.



Operation guidance

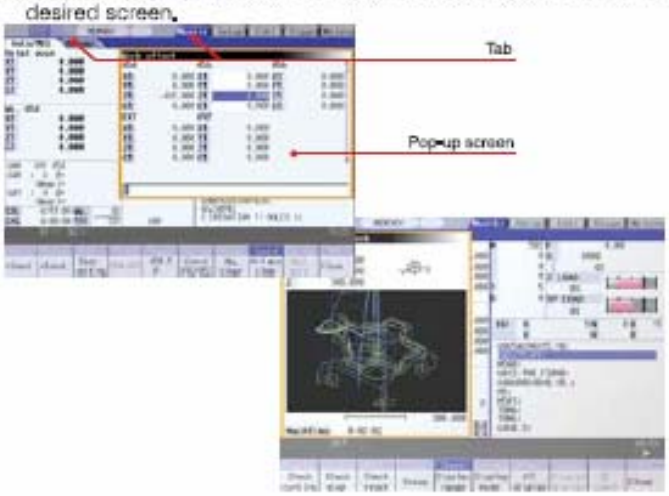
Parameter guidance

Alarm guidance

G-code guidance

Pop-up screen

●Supports pop-up screens and tabs that allow quick access to desired screen.



Multilingual

●Supports 17 languages, which secures reliable use worldwide.

Japanese
English
German
Italian
French
Spanish
Chinese (simplified)
Chinese (traditional)
Korean
Portuguese
Hungarian
Dutch
Swedish
Turkish*
Polish
Russian
Czech

*Under contemplation

Support

Plentiful functions enhancing productivity

Memory card interface

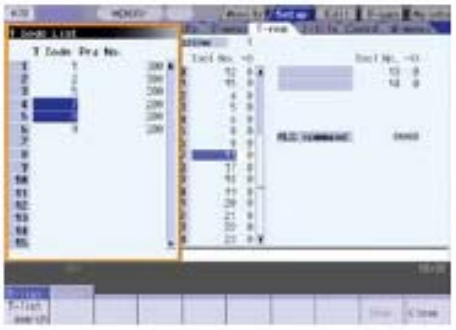
● A compact flash memory card interface, placed on the front of display, enables easy input/output of machining program, etc. You can edit and search the stored program from NC screen. The card slot, which can be completely covered by a lid, is highly dust-resistant.

Data transfer tool NC-Explorer

● Possible to transfer machining programs bidirectionally between NC and host computer via Ethernet.

T-code list

● Possible to check if a tool commanded in program has been registered or not, which can avoid errors due to registration omission.



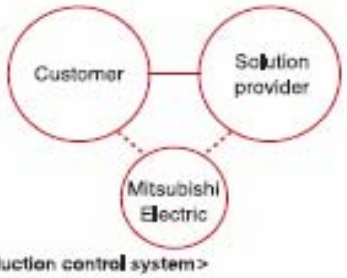
Machining time calculation

● Calculates approximate run time of a program without activating a machine.

Machining time indicated

Communication middleware EZSocket

● EZSocket is FA communication middleware designed to maximize the effectiveness of Mitsubishi FA equipments. Mitsubishi Electric has joined hands with solution providers specializing in information technology in order to meet customers' diverse needs.



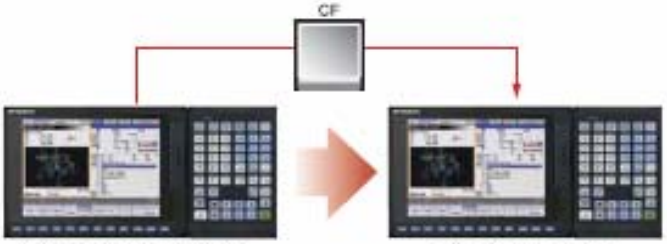
<Example of production control system>

Support

Various support functions minimizing down time

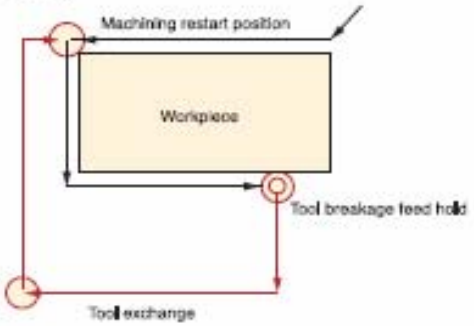
Data backup function

● Possible to backup NC data collectively and periodically in a CF card on the front of display. This backup data is helpful in restoring in case of accidents.



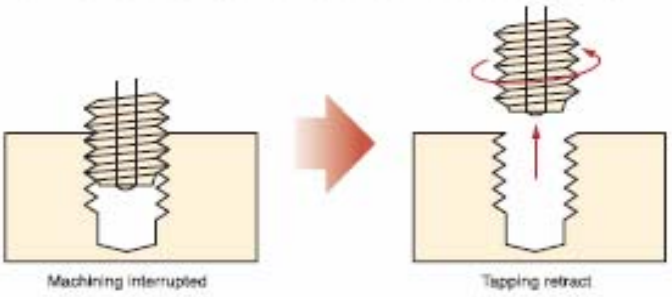
Program restart function

● Possible to restart a program even when machining program is interrupted in the middle due to tool breakage or power outage, etc., by automatically searching a block that was last executed at the interruption.



Tapping retract

● Even when tapping is interrupted due to emergency stop or power outage, etc., a retraction of the tool out of a workpiece can be automatically carried out at the restart of the operation.



Vertical axis anti-drop function at power outage

● Power supply unit commands to retract a gravity axis immediately on detecting a power outage, so as to prevent a crash with a workpiece.