3. SPECIFICATIONS AND MACHINE PROPER

3-1) Machine Specifications (With Mark ※ means Op: Options.)

3-1-1) Axis strokes and distances (Refer to P-17.)

(1) X-axis travel: ---------- 750 mm
(Saddle longitudinal movement: Reference point/ + stroke end)

(2) Y-axis travel: ---------- 750 mm
(Spindle head vertical movement: Reference point/ + stroke end)

(3) Z-axis travel: ---------- 750 mm
(Table cross movement: Reference point/ + stroke end)

(4) Distance from table surface to spindle center line (Y-axis): 150 to 900 mm

(5) Distance from table center line to spindle nose (Z-axis): 150 to 900 mm

3-1-2) Pallet table (Refer to P-21.)

(1) Pallet size: ---------- 500 mm x 500 mm

(2) Max. load on pallet (uniform load): ---------- 600 kg

(3) Pallet surface configuration: 24 M16 tapped holes with 100 mm pitch

(4) Shape of pallet clamp section: 4 (four) taper cone type clampers

(5) Min. table index angle: (72 position index table) ---------- 5°
※ Ditto : (360 position index table) ---------- 1°
※ Ditto : (NC table) ---------- 0.001°

3-1-3) Spindle (Refer to P-16, 18 & 19.)

(1) Spindle speed range: ---------- 50 - 12000 min^{-1}
(1 min^{-1} increment)

(2) Type of spindle taper hole: ---------- 7/24 taper (No.50)

3-1-4) Feed rate

(1) Rapid feed rate: ---------- (X, Y, Z) 40000 mm/min

(2) Cutting feed rate: ---------- (X, Y, Z) 1 - 30000 mm/min

(3) Jog feed rate: ---------- (X, Y, Z) 1 - 2000 mm/min
(24 steps)

3-1-5) ATC (Automatic Tool Changer) (Refer to P-22 to 27.)

(1) Type of tool shank: ---------- BT50
※ CT50

(2) Type of retension knob: ---------- P50T-2 (30°)
※CT type available

(3) Tool storage capacity: ---------- 30 tools
※40/60/127/179/231 tools

(4) Max. tool dia. (in case tool storing next to next): ----- 130 mm
(Std. ATC Holder pitch 133.35 mm)
※ (Matrix type ATC holder pitch 140.00 mm)
(Max. tool dia. in case of one tool in every 2nd tool pot: 240 mm)

(5) Max. tool length: ---------- 400 mm

(6) Max. tool mass: ---------- 20 kg

(7) Method of tool selection: Random selection by pot designation
※ Matrix type ATC: Fixed address

3-1-6) Motors

(1) For main spindle drive:
For low speed winding, AC 22KW (50% ED)/ 15 kw (Cont.)
For high speed winding, AC 30kw (30 min)/ 26 kw (Cont.)

(2) For axis feed: (For X, Y, Z) AC 5.0 kw
(For 72/360 div. table/B-axis) AC 0.9 kw
※(For NC table/b-axis) AC 2.1 kw

(3) For hydraulic pump unit (For M/C bodies): ---------- 2.2 kw

(4) For slideway lubrication: ---------- 0.02 kw

(5) For spindle cooler: (Compressor/Pump) 0.6 kw/ 1.5 kw

(6) For drain vacuming of spindle cooler: ---------- 0.2 kw

(7) For spindle motor cooling: ---------- (Fan cooler) 0.035 kw
(Electrical fan) 0.027 kw

(8) For ATC changer: ---------- 0.36 kw

(9) For ATC magazine drive (Std.): ---------- 1.5 kw
※ For ATC carrier drive: ---------- 0.9 kw x 2 pcs

(10) For internal chip conveyor: ---------- 0.1 kw x 2 pcs

(11) For ATC shutter of SPG: ---------- 0.12 KW

(12) For coolant pump (Flood coolant): ---------- 0.4 kw

Note) On other motors, refer to 'M/C SPECIFICATION SHEETS' submitted.

3-1-7) Electric power & pneumatic source

(1) Electric power source: AC 200/220V ±10%, 50/60Hz ±2%, 58 KVA (Std.)

- Wires for electric power source: ---------- 50 mm^2 x 3 pcs
- Grounding wire: ---------- 14 mm^2 x 1 pc

(2) Pneumatic source: 0.49 MPa {5 kgf/cm^2} or more, 500L/min (in atmospheric pressure) or more (For std. specification)

- Required air volume: 500L/min (in atmospheric pressure), continuous use
- Use clean air with room temp. + 2℃ or less.

3-1-8) Tank capacity

(1) Hydraulic tank unit: ---------- 25 L

(2) Lubrication tank: ---------- (For slide ways) 1.8 L
(For spindle lubrication) 1.8 L

(3) Tank for spindle cooler: ---------- 35 L

(4) Coolant tank: ---------- 400 L

3-2) Standard M/C Accessories

(1) Dummy tool: ---------- 1 pc

(2) Standard tools (Spanners & wrenches): ---------- 1 set

(3) Fuses (Spares): ---------- 1 set

(4) Leveling bolts & Leveling sheets: ---------- 1 set

(5) Installation components (Jet anchor type): ---------- 1 set

(6) Internal chip conveyor (Spiral coil type): ---------- 2 sets

(7) Flood coolant device: ---------- 1 set

6 (six) nozzles, 0.4 kw pump (Pump discharge volume: 155/200L/min (50/60 Hz) Water lift 5 m in normal temp. and clean water with no load by pump manufacturer's catalogue) are equipped.

CAUTION: NEVER USE CLEAN WATER ONLY AS COOLANT.

(8) Coolant tank (Floor type, 400 L): ---------- 1 set

Note) Tank must be cleaned in suitable interval for better M/C maintenance.

(9) Work lamp (Fluorescent lamp, 20 w): ---------- 1 set

(10) Alarm/Machining finish display lamp (2 story signal tower): ---- 1 set

- Alarm display: Red
- Machining finish: Yellow (Lit with M00, M01, M02, M30.)

(11) Spindle speed meter/Override: ---------- 1 set

- Spindle speed meter: Displayed on CRT screen.
- Override: External rotary switch operation

(12) Spindle load meter (Displayed on CRT screen in percentage.): --- 1 set

(13) Automatic power shut OFF device (Displayed and set on CRT screen.): 1 set

(14) Spindle cooling device (Synchronized with temp. of M/C body.): 1 set

- Compressor: 0.6 kw, Pump: 1.5 kw

(15) Cooler for spindle motor: ---------- 1 set

- Fan cooler: 0.035 kw, Electric fan: 0.027 kw

(16) Plug socket (Convenience outlet), AC 100V (1 A): ---------- 1 set
(Attached to main control cabinet.)

(17) Door interlock (SPG door/ ATC magazine door): ---------- 1 set

(18) Rigid tap function

3-3) NC Unit Specifications

3-3-1) Model: FANUC SYSTEM 16MA

3-3-2) Standard specifications

Underlined specifications are NIIGATA STANDARD (FANUC Options).
Specifications marked ☆ (Op.: Option) are leveled up specification by equipping optional specification.

☆(1) Control method: Controlled by AC Servo Motors and Pulse Coders.

(2) Controlled axes:

☆ · Controlled axes: 3 axes (X, Y, Z)
☆ · Simultaneously controllable axes: 3 axes (Positioning: G00
Linear interpolation: G01)
2 axes (Circular interpolation: G02/G03)

(3) Input command

- Least input increment: 0.001 mm
- Max. programmable dimension: ±99999.999 mm
- Absolute (G90)/ Increment (G91) programming
- Decimal point programming
- Tape code: EIA/ISO auto judgement

(4) Feed

- Cutting feed rate: F5 digit programming in mm/min designation
- Dwell: G04
- Jog feed: 1 - 2000 mm/min (24 steps)
- Hand wheel feed: One manual pulse generator, 0.001/0.01/0.1 mm per 1 div.
- Rapid traverse override: F0, 25/50/100 %
- Feed rate override: 0 - 200 % (10 % increment)

(5) Part program storage and edit

☆ · Part program storage: Equivalent with 80 m punched tape

Note) In ATC program;
- Program 1 (one) number
- Program capacity: About 1 m
- Program No.: O 9001

is used.

(6) Operation and program

☆ · Operation panel: 9 inch monochrome PDP (plasma) character display (English)
· MDI function

(7) I/O function and device

· I/O interface: RS232C

(8) S, T and M-function

· Spindle speed function (S-function): S5 digit direct programming
· Spindle speed override: 50 - 120 % (10 % increment)
· Tool function (T-function): T4 digit programming
· Miscellaneous function (M-function): M3 digit programming
· 2nd miscellaneous function (B-function): B3 digit programming

(9) Tool offset functions

· Tool length offset: G43, G44, G49
☆ · Cutter compensation 'B': G39 - G42
· Tool offset: G45 - G48
· Tool offset numbers: 32 numbers
☆ · Tool offset memory 'A': H & D same numbers of memories

(10) Coordinate systems

· 2nd reference point return: G30
· Work coordinate system change: G92
· Work coordinate systems: G54 - G59
· Local coordinate system: G52

(11) Operation support function

· Single block
· Optional block skip
· Dry run
· M/C lock
· Auxiliary function lock
· Mirror image (MDI operation)
· Z-axis feed command cancel
· Skip function: G31

(12) Program support function

· Circular interpolation by radius programming
· Canned cycles: G73, G74, G76, G80 - G89, G98, G99
· Sub-program: M98, M99
· Programmable data input: G1012 (Coordinate system offset, Tool offset change, Parameter input)
☆ · Program number memories: 63 numbers (See Note in back page.)

(13) Mechanical error compensation

· Independent backlash compensation for feed and rapid traverse