Intelligent High Speed CNC Drill with Versatility

FANUC ROBODRILL

α-T21*i*Fs/T21*i*F/T21*i*FL

α-T14*i*Fs/T14*i*F/T14*i*FL

α-T21*i*Fse/T21*i*Fe/T21*i*FLe

α-T14*i*Fse/T14*i*Fe/T14*i*FLe

Intelligent High Speed CNC Drill with Versatility

FANUC ROBODRILL α-*i*F series

FANUC ROBODRILL α-*i*F series is a high speed versatile AI CNC drill with spindle taper size No. 30 for high precision and high efficiency production.

High speed, high precision, and ultimate efficiency

Nano CNC System
- Has a ultra-precision pulse coder for control with interpolation and feedback in nanometers

High acceleration positioning
- Acceleration over 1.5G

Rigid structure of machine mechanism
- High precision machining at high efficiency

AI contour control I & HRV control
- Greatly reduces profile errors caused by servo delays

DDR260*i*
- Enables easy addition of one additional axis.
- High precision simultaneous 4-axis machining with a synchronous built-in servo motor.
- Considerably reduced index time (to 1/3 of conventional ones).

Intelligent Control

AI contour control II
- Implements very smooth machined surfaces

AI tool life management/ AI tool monitoring
- Tool life management based on frequency and time of use, and cutting load

AI thermal displacement compensation
- Compensation for thermal displacement that may occur when the spindle and feed axis operate

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α-T21*i*Fs/T21*i*Fse
α-T14*i*Fs/T14*i*Fse

980mm

Space saver

Stroke X300×Y300(+100)×Z330mm

α-T21*i*F/T21*i*Fe
α-T14*i*F/T14*i*Fe

1,550mm

Best seller drill with No.30 Taper

Stroke X500×Y400×Z330mm

α-T21*i*FL/T21*i*FLe
α-T14*i*FL/T14*i*FLe

2,100mm

Wide stroke

Stroke X700×Y400×Z330mm

Tool turret	X-axis travel(Longitudinal movement of table)			Control unit
	300mm	500mm	700mm	
21Tools	α-T21*i*Fs	α-T21*i*F	α-T21*i*FL	Series 31*i*-A5
14Tools	α-T14*i*Fs	α-T14*i*F	α-T14*i*FL	
21Tools	α-T21*i*Fse	α-T21*i*Fe	α-T21*i*FLe	Series 31*i*-A
14Tools	α-T14*i*Fse	α-T14*i*Fe	α-T14*i*FLe	

Suitable for a wide range of parts machining and three-dimensional machining

Robotization, Networking, and System integration

em
machining cell to a large-scale production line

Ethernet
nsfer and network building

CIMPLICITY® *i*CELL
achining programs and monitors the operating status
onal computer

tom PMC function
creation of sequence programs suitable for your peripheral
pment

Operational Excellence

- MANUAL GUIDE *i*
- Quick editor
- Production control and tool counter
- Setup file

Safety Excellence

- Conformance on the European and Chinese safety standards
- Dual check safety function
- Front door with an electromagnetic lock

Management Excellence

- ISO9001 certified
- ISO14001 certified

Versatile Applications to Meet Wide-variety of Machining Needs

Auto parts machining

Highly rigid mechanism achieves heavy machining efficiently in milling, boring and side cutting. Multi-face machining and contouring makes auto parts machining easier.

Crank case

Exhaust manifold (FCD450)

Electrical parts and small parts

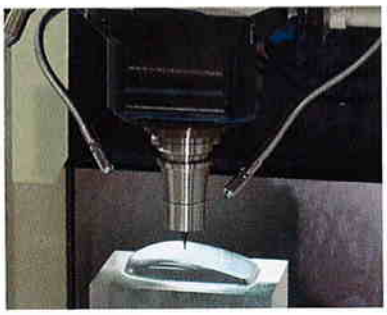
High speed axis feed, high speed spindle operation and optimal acceleration and deceleration control provides efficiency of machining and reduced cycle time. This series is also suitable for machining of electrical and small parts, from high-speed cutting of light metal such as aluminum to cutting of stainless steel.

2.5″HDD frame

Stainless steel parts

Three-dimensional machining

High-speed and High-precision machining for resin models, electrodes and precision parts, is possible with high speed processing. NURBS interpolation and super-minute line segment program provide smooth machined surfaces requiring little finishing, in a short time.

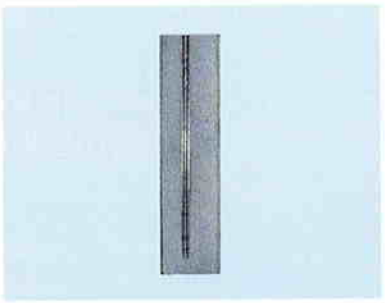


Resin model

Graphite electrode

Deep and small hole drilling

Deep hole over 30 times deeper than the hole diameter and small hole about 0.1mm at its diameter can be drilled.

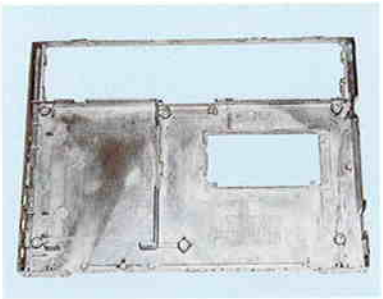


Deep hole (ϕ3.3×96mm) drilling (section) (SUS430)

ϕ16×150mm (SCM420)

Deburring and chamfering

Precise high-speed contouring allows deburring and chamfering for sophisticated parts such as magnesium mold, die cast, forged or cast parts. This series is also available for machining the datum plane at the succeeding process.



Personal computer case (magnesium)

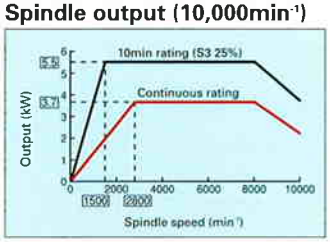
Gear (SCM420)

High-precision indexing is made possible by using a closed loop

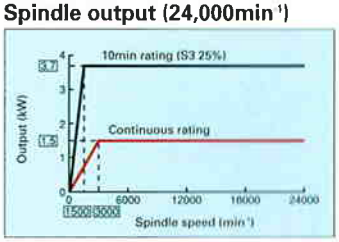
High speed and high power spindle

- Spindle is directly coupled with its motor.
- Least maintenance due to grease sealed bearings.
- The high speed and high precision ball bearing is used for the high-speed spindle.
  (Some of touch switches may not be used according to the type of it.)

Spindle output (10,000min^{-1})



Spindle output (24,000min^{-1})



Spindle organization

Spindle	Coolant	BT tooling	DIN tooling	NC5 tooling	BIG-PLUS tooling
10,000min^{-1}	External coolant	Possible (BT30)	Possible (DIN69871-A30)	Possible (NC5-46)	Possible (BBT30)
	Center through coolant				
24,000min^{-1}	External coolant	Possible (BT30)	Possible (DIN69871-A30)	Impossible	Possible (BBT30)
	Center through coolant				

Compact, very rigid basic structure and high-speed, fast-acceleration axis feed

- Rapid traverse speed :
  54m/min with FANUC Series 31*i*-A5/
  48m/min with FANUC Series 31*i*-A
- Max. Acceleration :
  over 1.5G with FANUC Series 31*i*-A5/
  over 1.3G with FANUC Series 31*i*-A
- Z-axis travel : 330mm

X-axis travel	Y-axis travel	Table working space	Table loading capacity
300mm	300+100(*)mm	630×330mm	150kg
500mm	400mm	650×400mm	250kg
700mm	400mm	850×410mm	250kg

(*) The additional amount of 100 mm is provided for improving approach characteristics during work.

High speed rigid tapping

- Max tapping up to 8,000min^{-1} (at 24,000min^{-1} spindle)/5,000min^{-1} (at 10,000min^{-1} spindle)
- Reduced tapping cycle time by quick extraction with override up to 20 times.

Simultaneous 4-/5-axis machining

- Additional 1-/2-axis control can be added to enable simultaneous contour control of up to 4 or 5 axes.
- High-precision indexing is made possible by using a closed loop.
- With the FANUC Series 31*i*-A5, One or two additional axes can be added.
- With the FANUC Series 31*i*-A, One additional axes can be added.
- An index table can be used to enable multi-surface machining.

Four-face machining using an additional axis and an index table
Cylinder head (ADC12)

Three-dimensional contouring using two additional axes and a tilting index table
Impeller (Aluminum alloy)

High speed and high reliable tool change (Patent pending)

- Simple and reliable proprietary tool turret mechanism
- Tool changing time (cut to cut) : 1.6sec.
- Models for 21 tools and for 14 tools are available.

Superior performance for machining

Versatile machining is possible including drilling, tapping, milling and profiling.

A machining sample with 10,000min^{-1} spindle (*1)

Workpiece	Medium carbon steel	Gray cast iron	Aluminum alloy die casting	Workpiece	Medium carbon steel	Gray cast iron	Aluminum alloy die casting
Drill diameter Drill material	25 dia. HSS	25 dia. HSS	30 dia. HSS	Tap size Tap pitch	M16 2	M20 2.5	M24 3
Spindle Speed S	318	382	637	Spindle Speed S	298	264	219
Feedrate F (*2)	48	115	255	Feedrate F (*2)	596	660	657
Coolant	Water-immiscible cutting fluid	Emulsion type water-miscible cutting fluid		Coolant	Water-immiscible cutting fluid	Emulsion type water-miscible cutting fluid	
Load meter %	140	140	140	Tolerance class	6H		

Enhanced high speed and high acceleration spindle reduces machining cycle time significantly.

A machining sample with 24,000min^{-1} spindle (*1)

Workpiece	Medium carbon steel	Aluminum alloy die casting	Workpiece	Medium carbon steel	Aluminum alloy die casting
Drill diameter Drill material	20 dia. HSS	22 dia. HSS	Tap size Tap pitch	M16 2	M24 3
Spindle Speed S	398	1012	Spindle Speed S	298	219
Feedrate F (*2)	40	253	Feedrate F (*2)	596	657
Coolant	Water-immiscible cutting fluid	Emulsion type water-miscible cutting fluid	Coolant	Water-immiscible cutting fluid	Emulsion type water-miscible cutting fluid
Load meter %	140	125	Tolerance class	6H	

(*1) Sample data may vary on machining conditions
(*2) Unit : mm/min

Intelligent Control

High-speed control

Bell-shaped acceleration/deceleration, in-position width switching for rapid traverse/cutting feed, rapid traverse overlapping, and other control functions, as well as AI contour control I for reading 30 blocks in advance, optimize axis motion and reduce machining cycle time.

Optimal acceleration/deceleration

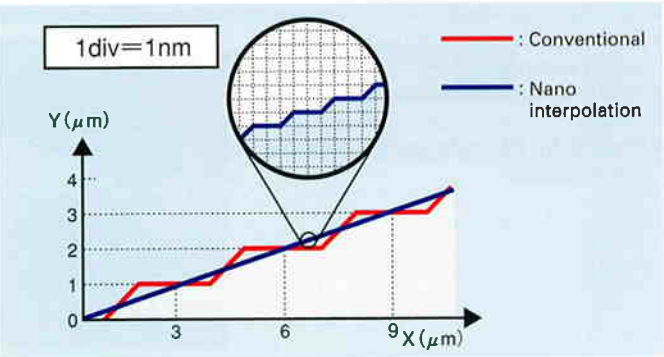
During positioning, acceleration/deceleration is optimally controlled according to the torque and speed characteristics of the motor.
Making full use of the motor characteristics at a low speed reduces positioning (rapid traverse) time, resulting in reduction in machining cycle time.

HRV control

The latest and quick response servo motor αi series with an high-precision pulse coder of 16,000,000/rev. resolution is adopted. And a combination of HRV control, which are leading-edge digital servo/spindle control technologies, reduces possible servo delay and allows the least tracking error on high-speed machining.

Nano interpolation

Nano-interpolation is ultra-precision interpolation which calculates a position command to be transmitted to the digital servo in nanometers (nm) even when the unit used for the command in the program is μm. Together with nano-feedback by the high-precision pulse coder with a resolution of 16,000,000/rev., nano-interpolation implements very smooth movement to improve the precision of machined surfaces.

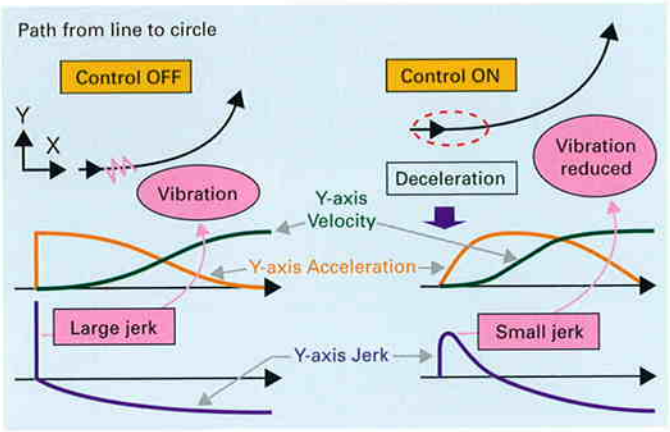


AI contour control Ⅱ (option)

AI contour control Ⅱ implements high-speed, high-precision machining by reading 200 blocks in advance for acceleration/deceleration control.
The number of blocks to be read in advance can be increased, thereby enabling up to 1,000 blocks to be read in advance for acceleration/deceleration control. This enables high-speed, high-precision machining without feedrate variations even for a program consisting of super-minute line segments. Nano-interpolation can be used to obtain smooth machined surfaces requiring little finishing.

Jerk Control (option)

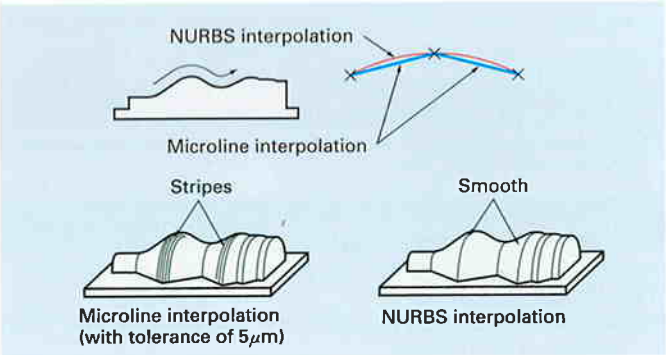
Mechanical shock during machining is reduced more than ever before by performing acceleration/deceleration control (smooth bell-shaped acceleration/deceleration before interpolation) that keeps a low level of jerk, which is the rate of change of acceleration with respect to time. In a machining program, a portion in which a specified profile is smooth but significant change in acceleration causes mechanical shock is automatically determined, and controlled so that a suitable speed is achieved.



NURBS interpolation (option)

NURBS curves, which have become widespread as a method of representing free curves, can be specified in a program. High-precision interpolation is performed on each NURBS curve so that a smooth machined surface very close to the designed profile can be obtained. The size of a program can also be reduced as compared with that of a program consisting of minute straight line commands.

Note) CAM system for programming is required to support the NURBS interpolation



Nano-smoothing (option)

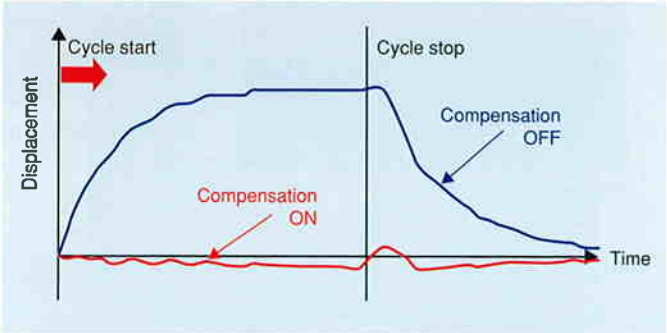
From a program consisting of minute line segments created with a CAD/CAM system, the original curved surface is estimated as NURBS curves. The generated NURBS curves are interpolated in nanometers, so that a smooth machined surface close to the designed profile can be obtained, thereby reducing the number of hand finishing process steps.

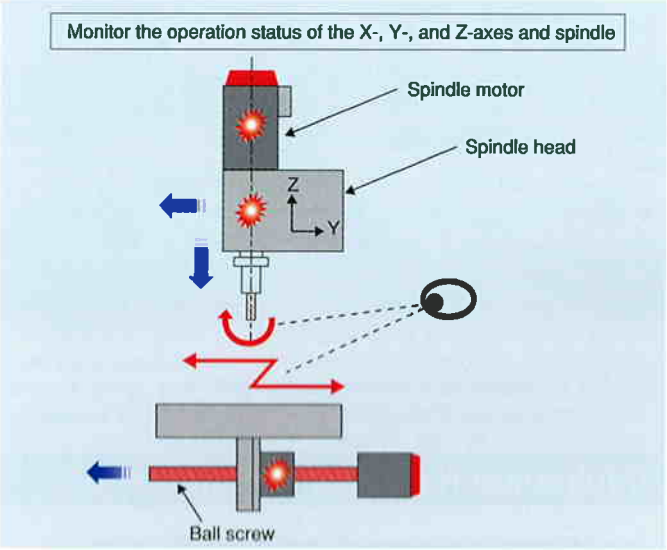
Fast data server (option)

A huge program for three-dimensional machining that contains continuous settings for small amounts of travel can be stored on the compact flash card built into the fast data server, and can be used for high-speed machining. DNC operation can also be performed from a personal computer.
Memory-based operation can be performed using macro statements and subprogram calls from the compact flash card.
Programs stored on the compact flash card can be edited.

AI thermal displacement compensation

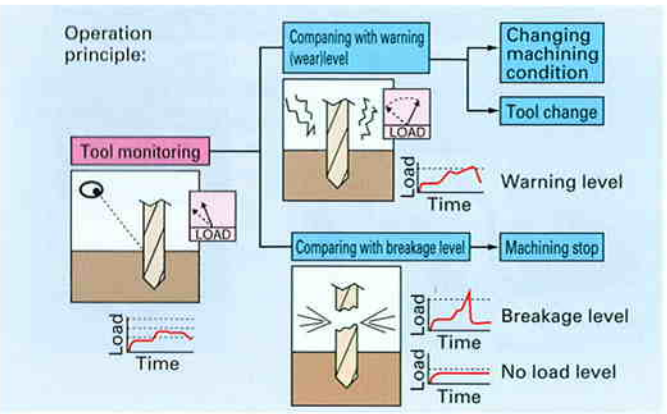
Compensation for thermal displacement is carried out at real time by monitoring the operation status of the spindle and feed axis and estimating an elongation along the each axes. (The precision of compensation varies with the operating conditions.)





AI tool life management / AI tool monitoring (option)

The tool life management traces tool status such as frequency or time of use and replaces a tool when its usage exceeds the preset value. This prevents any trouble on cutting tools such as broken drill.
The built-in AI tool monitor watches actual load on drilling by detecting directly external disturbance load of the spindle motor.This provides superior tool management. (For usable ranges, contact FANUC.)

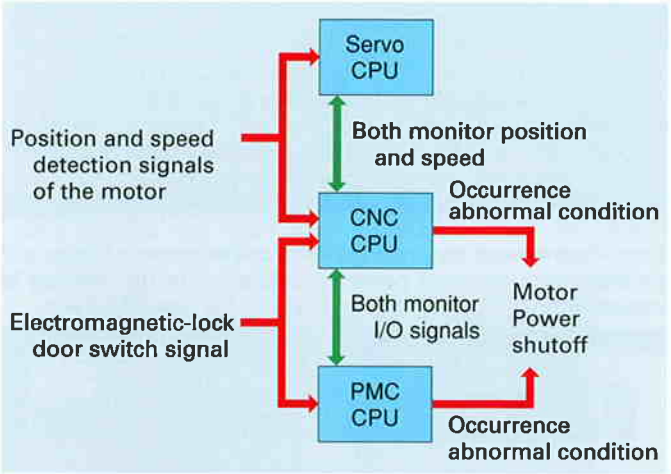


MANUAL GUIDE *i*

MANUAL GUIDE *i* can be used to perform all operations from creation of a program to machining on one screen simply.
A conventional program using G codes can be created simply using a graphical menu guide. Hole position specification and pocketing can be entered simply without calculations. High-speed real animated simulation with a solid model allows simple machining simulation.

Safety

A dual check safety function is installed, which doubly monitors feedrate, position, and safety signals using two CPUs. Neither special operation nor waiting time for safety check is required. Together with the electromagnetic lock mechanism on each door, this function ensures the safety of the operators without reducing efficiency. The category-3 safety level defined in EN 954-1 is ensured.



Compliance with safety regulation (option)

Compliance with safety regulation for EU countries (CE mark) and China is available.

Robotization, Networking and System Integration

Robotization

With its robot interface functions for ROBODRILL, the AI CNC drill makes it possible to configure machining systems easily for workpiece loading/unloading, deburring, and other purposes, using robots.

- Provides a built-in interlock function with consideration given to safety. (Interlock panel is not required.)
- Capable of accommodating not only one ROBODRILL with one robot but also two ROBODRILLs with one robot.
- Enables robot jogging, robot hand opening/closing, automatic side door opening/closing, system status display, and robot program selection on the robot operation screen.

It also makes it possible to configure machining robot systems that eliminate the need for peripherals by using multiple robots.

Robot operation screen

Example of robot hand

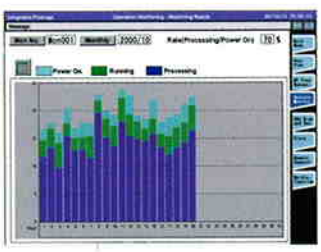
Compact machining system with LR Mate 200*i*C

Machining robot system

Network

The Ethemet function is available as standard communication for network.

Centralized management package **FANUC CIMPLICITY®*i*CELL** can be used on a personal computer connected to the network to manage ROBODRILL programs and monitor the operating status.



Equipment for system configuration

Centering system

Probe

Receiver

Broken tool detection unit

Mist separator

Coolant unit with chip conveyor

2-pallet type pallet changer installed at side

Easy Operation

Production control and tool counter

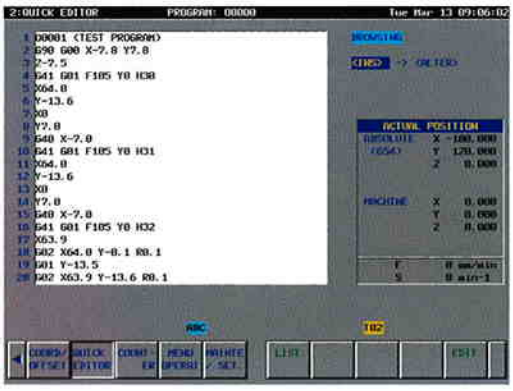
Two production monitoring counters and two accumulation counters are applicable for recognition of scheduled parts production, status display, termination of machining and so on. These counters are indispensable for production. The use status of tools with the tool life management function can also be checked using the tool counter on the same screen.

Setup file

Initial setting information can be stored such as parts coordinate system, offsets values, program identification and so on. Automated initialization for operation is available simply by calling a set of information for ease of use.

Quick editor

Quick editor used to create or edit a program is an easy-to-use full-screen editor, which can perform copy, move, search, cursor jump, and other operations like an editor for PCs. The guidance input function for G codes or M codes allows you to edit a program efficiently. Effective edit of programming is also possible through on- screen selection of G and M codes with guidance.



Program management

Large-sized program memory can be easily managed based on program folders and file names (each having up to 32 characters).

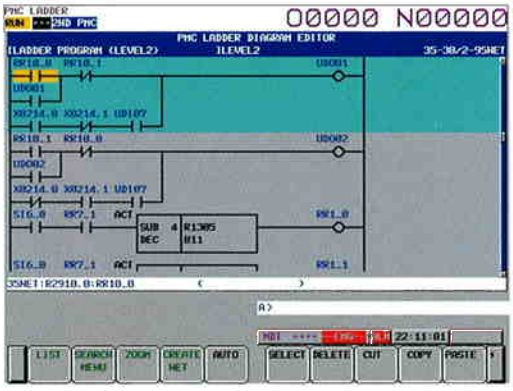
Compact operator's panel and 10.4"color LCD

Standard display with 10.4" color LCD integrated with the operator panel features ease of use with least key stroke operations. The soft keys vertically provided to the right of the display unit can be used as machine operation menu keys.
In a memory card slot located at the side of the display unit, a compact flash card can be inserted to perform DNC operation or to enable the card to be used as a large-sized program memory device.

* The above photo is that for α-T21*i*F and α-T14*i*F

Custom PMC

The custom PMC function which allows simple control of peripheral devices is installed as standard. A sequence program can be created and edited easily on a screen. Only PMC programs for peripheral devices can be read and written. This function provides 16 input signals and 16 output signals as basic features, and also makes available up to 1024 input signals and 1024 output signals in total as optional features to meet the needs of the customer's system.



Accessory (option)

Wide opening door :
730mm for α-T14*i*F

Air blow for chips

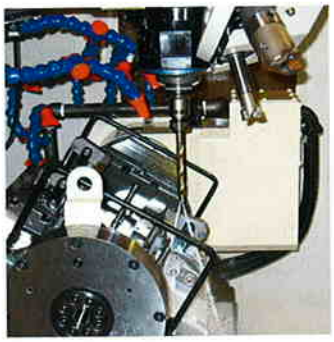
Top cover

Signal lamp

Tool length switch for automatic measurement

Coolant unit (tank)

Coolant unit with chip flush
(spot gun provided)



Center through coolant

Illumination

Indexing system DDR 260*i*

Automatic fire extinguisher (Note)

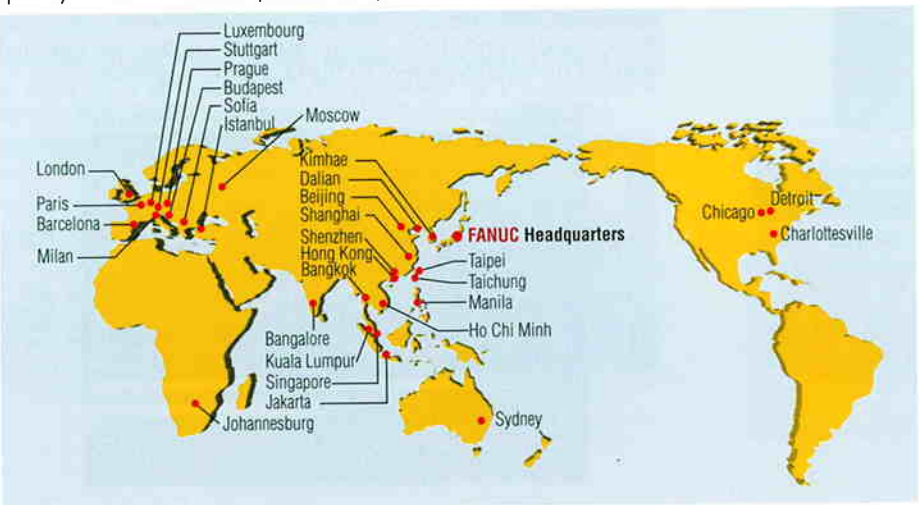
Intermittent central lubrication

Operation panel with alphabetical key

(Note) If machining "combustible materials" such as resin and magnesium or if using a water-immiscible cutting fluid, select an automatic fire extinguishing system because of fire hazards.
For information on the objects that can be extinguished by an automatic fire extinguishing system, contact your ROBODRILL sales representative.

Worldwide customer service and support

FANUC operates customer service and support system anywhere in the world through subsidiaries, affiliates and distributor partners. FANUC provides the highest quality service with the quickest response at the location nearest you.



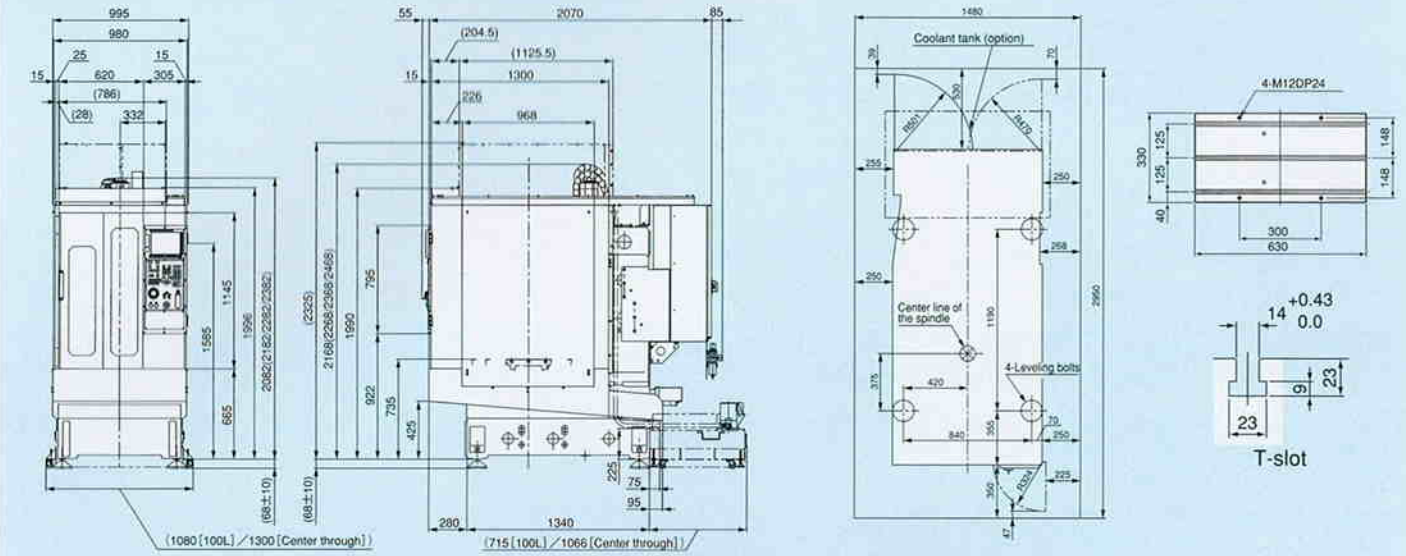
FANUC training center

FANUC Training Center operates training programs on FANUC ROBODRILL *i* series throughout the year, which focus on practical operations and programming with machining know how and maintenance.

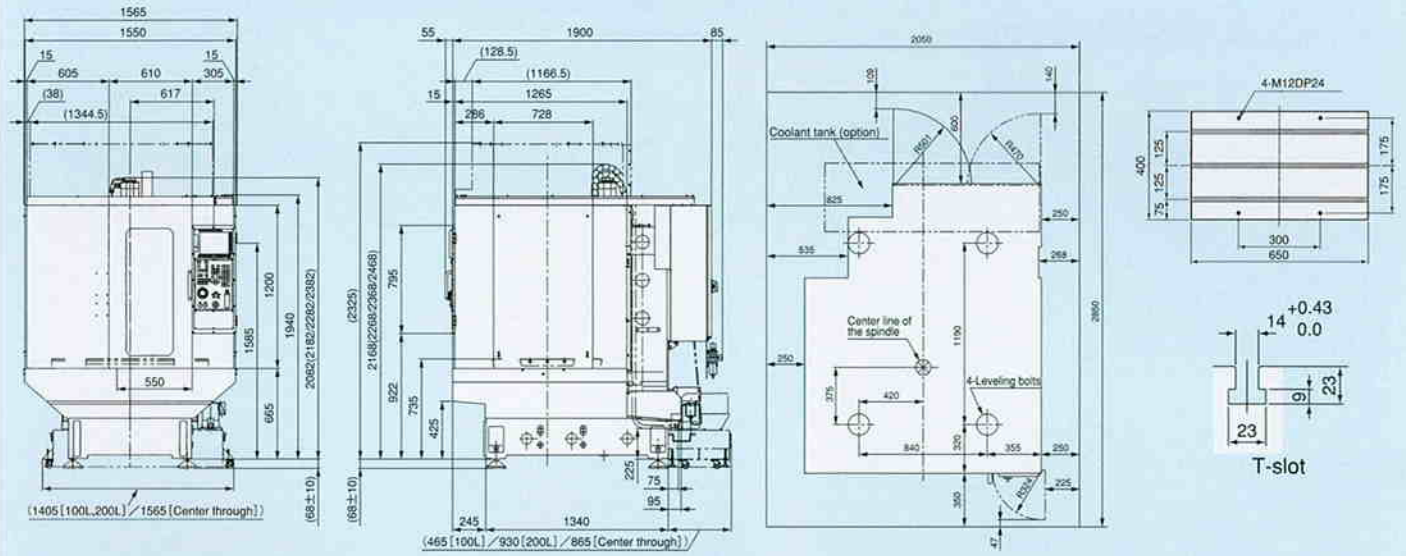
Inquiries : Yamanakako-mura,
Yamanashi, Japan 401-0501
Phone : 81-555-84-6030 Fax : 81-555-84-5540

Outer dimensions

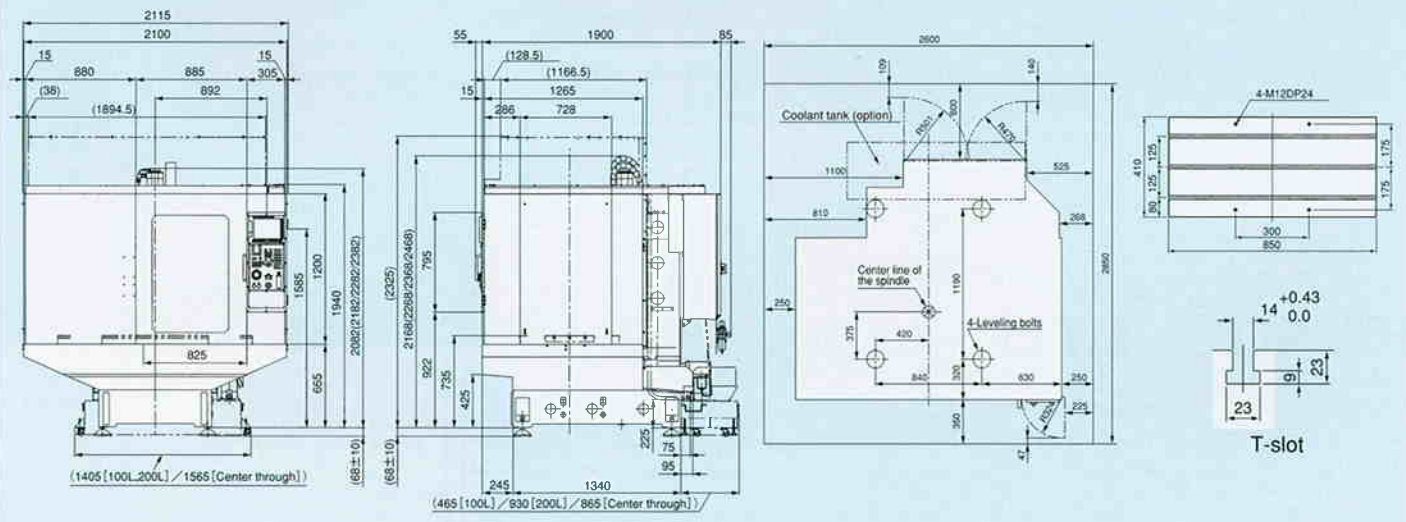
α-T21*i*Fs/T14*i*Fs/T21*i*Fse/T14*i*Fse



α-T21*i*F/T14*i*F/T21*i*Fe/T14*i*Fe



α-T21*i*FL/T14*i*FL/T21*i*FLe/T14*i*FLe



FANUC ROBODRILL α-*i*F series

Item		α-T21*i*Fs/T21*i*Fse α-T14*i*Fs/T14*i*Fse	α-T21*i*F/T21*i*Fe α-T14*i*F/T14*i*Fe	α-T21*i*FL/T21*i*FLe α-T14*i*FL/T14*i*FLe
Machine (Standard)				
Capacity	X-axis travel (Longitudinal movement of table)	300mm	500mm	700mm
	Y-axis travel (Cross movement of saddle)	300mm + 100mm	400mm	
	Z-axis travel (Vertical movement of spindle head)	330mm		
	Distance from table surface to spindle gage plane	150 to 480mm (When no high column is specified)		
Table	Working space (X-axis × Y-axis)	630 × 330mm	650 × 400mm	850 × 410mm
	Capacity of workpiece mass	200kg (uniform load)	300kg (uniform load)	
	Working surface configration	3T-slots, size 14mm pitch 125mm		
Spindle	Speed range	100～10,000min^{-1}		
	Spindle gage (Call number)	7/24 taper No.30 (with air blow)		
Feedrate	Rapid traverse rate	54m/min (X,Y,Z) : α-T21*i*Fs/T21*i*F/T21*i*FL/T14*i*Fs/T14*i*F/T14*i*FL 48m/min (X,Y,Z) : α-T21*i*Fse/T21*i*Fe/T21*i*FLe/T14*i*Fse/T14*i*Fe/T14*i*FLe		
	Feedrate	1 to 30,000mm/min		
Turret	Tool change system	Turret type		
	Type of tooling	JIS B 6339-1998 BT30, MAS 403-1982 P30T-1 (45°)		
	Tool storage capacity	21tools : α-T21*i*Fs/T21*i*F/T21*i*FL/T21*i*Fse/T21*i*Fe/T21*i*FLe 14tools : α-T14*i*Fs/T14*i*F/T14*i*FL/T14*i*Fse/T14*i*Fe/T14*i*FLe		
	Maximum tool diameter	80mm		
	Maximum tool length	200mm : α-T14*i*Fs/T14*i*Fse 190mm (Changed by specifications) : α-T21*i*Fs/T21*i*Fse	250mm (Changed by specifications)	
	Method of tool selection	Random shortest path		
	Maximum tool mass	2kg/tool (total mass : 22kg) / 3kg/tool (total mass : 33kg) : α-T21*i*Fs/T21*i*F/T21*i*FL/T21*i*Fse/T21*i*Fe/T21*i*FLe 2kg/tool (total mass : 15kg) / 3kg/tool (total mass : 22kg) : α-T14*i*Fs/T14*i*F/T14*i*FL/T14*i*Fse/T14*i*Fe/T14*i*FLe		
	Tool changing time (Cut To Cut)	1.6 sec. (When 2kg/tool is specified)		
Motors	Spindle drive motor	5.5kW (10min rating) / 3.7kW (continuous rating)		
Accuracy	Single direction positioning accuracy(*1)	0.006/300mm : α-T21*i*Fs/T21*i*F/T21*i*FL/T14*i*Fs/T14*i*F/T14*i*FL 0.010/300mm : α-T21*i*Fse/T21*i*Fe/T21*i*FLe/T14*i*Fse/T14*i*Fe/T14*i*FLe		
	Positioning repeatability (*2)	±0.002mm		

Numerical control (Standard) (Note) ☆: α-T21*i*Fs/T21*i*F/T21*i*FL/T14*i*Fs/T14*i*F/T14*i*FL ※ : α-T21*i*Fse/T21*i*Fe/T21*i*FLe/T14*i*Fse/T14*i*Fe/T14*i*FLe

- Control unit FANUC Series 31*i*-A5 (☆)
- Control unit FANUC Series 31*i*-A (※)
- Basic controlled axes 3 axes (X,Y,Z)
- Simultaneously controlled axes (3 axes)
- HRV control
- Rapid traverse bell-shaped acceleration/deceleration
- Rigid tapping (M29)
- Manual handle feed
- Part program storage size (512Kbyte)
- Number of registerable programs (1000)
- Optimum torque acceleration/deceleration
- Back ground editing (Multi part program editing)
- Quick editor
- Control unit incorporated type display unit with 10.4"color LCD(*3)
- Reader/puncher interface
- Ethernet interface
- Workpiece coordinate system (G52～G59)
- Addition of workpiece coordinate system 48 pairs (G54.1)
- Helical interpolation
- Dual check safety
- Custom macro B (G65,G66/G67)
- Canned cycles for drilling (G73,G74,G76,G81～G89/G80)
- Coordinate system rotation (G68,G69)
- Setup file
- MANUAL GUIDE *i* (Included Measurement Cycle)
- Playback
- Retraction for rigid tapping
- AI thermal displacement compensation (XYZ axes)
- Skip function (G31)
- Multi-step skip (G31 P1～4)
- Tool compensation memory C D/H code, Tool geometry/wear
- AI tool life management
- Production control counter
- AI contour control I
- Stroke limit check before move
- Stored stroke check 1
- Stored stroke check 2 (G22/G23)
- Custom PMC

Option (Note) Some options applicable only to certain machine model and configurations. ☆ : α-T21*i*Fs/T21*i*F/T21*i*FL/T14*i*Fs/T14*i*F/T14*i*FL

- High column 100/200/300mm
- High speed spindle 24,000min^{-1}
- Center through coolant
- Double contact tooling (NC5-46/BBT30/NBT30)
- DIN Tooling (DIN 69871-A30)
- High torque spindle 10,000min^{-1}
- Ilumination
- Signal lamp (3 lamps)
- Tool length switch
- Automatic oil lubricating
- Centralized system of grease
- Splashguard wide opening door : 730mm (α-T21*i*F/T14*i*F/T21*i*Fe/T14*i*Fe)
- Splashguard wide opening door : 1100mm (α-T21*i*FL/T14*i*FL/T21*i*FLe/T14*i*FLe)
- Automatic front door opening/closing of splashguard
- Automatic side door of splashguard
- Side window of splashguard
- Basic top cover of splashguard
- Full-closed cover of splashguard
- Tool pot cover
- Coolant unit (Tank capacity : 100 (140)*7, 200L)
- Coolant unit with chip flush (Tank capacity : 100 (140)*7, 200L)
- Cleaning unit for tool taper shank
- Air blow for chips
- Z-axis metal cover
- Bed cover
- Automatic fire extinguisher
- Additional controlled 1axis (Simultaneously controlled 4 axes)
- Additional controlled 2axes (Simultaneously controlled 5 axes) (☆)
- Single direction positioning (G60)
- Cylindrical interpolation (G07.1)
- Conical/spiral interpolation
- NURBS interpolation (G06.2)
- Jerk control
- Tool center point control☆
- 3-dimensional cutter compensation☆
- 1-digit F code feed
- Inverse time feed (G93)
- Part program storage size (2Mbyte)
- Number of registerable programs 4000
- Operation panel with alphabet key
- Fast data server (with Compact Flash Memory 1GB)
- Memory card
- Fast Ethernet board
- FANUC CIMPLICITY® *i*CELL (for personal computer)
- AI tool monitoring
- Tool position offset (G45～G48)
- Addition of workpiece coordinate system 300 pairs (G54.1)
- Scaling (G51/G50)
- Figure copy (G72.1,G72.2)
- Interruption type costom macro (M96/M97)
- Peck drilling cycle for small deep holes
- Programmable mirror image (G51.1/G50.1)
- 3-dimensional coordinate conversion (G68/G69)
- Polar coordinate command (G16/G15)
- AI contour control II
- Look-ahead blocks expansion
- Nano Smoothing/Nano Smoothing 2
- Tool lengh automatic measurement (G37)
- High-speed skip
- Backup function for power failure
- External transfer
- Additional I/O unit
- FANUC LADDER-III (for personal computer)
- Compliance with safety reguration (for EU (CE Mark) or China)
- 3rd/4th reference position return
- Workpiece coordinate system preset G92.1
- Automatic breaker shutdown
- Indexing system DDR260*i*
- Learning Control for Rigid Tap
- Tool management function
- DeviceNet (master/slave)
- Power Mate CNC manager
- External touch panel interface

Installations (Note) Please make sure to comply with installation conditions specified by FANUC when installing ROBODRILL.

Power source	Power supply	200 to 220 VAC+10 to -15% 3-phase, 50/60Hz±1Hz 10kVA *4		
	Compressed air supply	0.35 to 0.55MPa(0.5MPa is recommend)(gage pressure) 0.13m^3/min(at atmospheric pressure) *5		
Machine size	Machine height	2,236±10mm (When no high column is specified)		
	Floor space	995mm×2,210mm	1,565mm×2,040mm	2,115mm×2,040mm
	Mass of machine	Approx. 1,950kg	Approx. 2,000kg	Approx. 2,100kg

*1 and *2 are measured in compliance with JIS B6201-1987.
*3 The color LCD has been developed with high-precision technologies and thus features high visibility and image quality. Note, however, that the screen may have a few missing or constantly lit pixels.
*4 In case of center through coolant and cleaning unit for tool taper shank, additional + 1kVA is required respectively. In case of additional 1 axis, additional maximum + 1.5kVA is required.
In case of additional 2 axes, additional maximum + 3kVA is required. A cable with 8mm^2 or more should be used at primary power connection.
*5 In case of center through coolant, additional + 0.05m^3/min is required. In case of air blow for chips, additional + 0.2m^3/min is required.
In case of side automatic door, 0.4 MPa compressed air supply or more is required.
*6 Fastening the machine to the floor (mounting anchors) may be required depending on the use conditions and installation environment, or to prevent the machine from toppling over due to an earthquake.
*7 In case of α-T21*i*Fs/T14*i*Fs/T21*i*Fse/T14*i*Fse

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