High-Reliability and High-Performance Compact Machining Center

FANUC ROBODRILL $\alpha$-DiB5$_{ADV}$ series

Advanced version
High Reliability and High-Performance Compact Machining Center

**FANUC ROBODRILL α-DiB5 ADV series**

### High Performance of Machining
- High speed, High precision, High power
- Stable machining
- Wide range of application

### Applying the latest FANUC CNC & Servo technology

### Good combination with FANUC Robot

### Minimizing Down Time
- High reliability
- Preventive maintenance function
- High maintainability

### Ease of Use
- Excellent user-Interface
- High expandability
- Simple integration with FANUC Robot
High Performance of Machining

Achieving high productivity by high speed, high precision and high power
Achieving high yield of workpiece by stable machining
Utilization in various areas by wide range of application

Minimizing Down Time

Achieving long operation life by high reliability
Prevention of trouble by preventive maintenance function
Minimizing down time by high maintainability

Ease of Use

Easy utilization of high function by excellent user-Interface
Easy operation of peripheral equipment by high expandability
Realizing simple integration with FANUC Robot by automation support function
Expanding application range

- Expanding machining area
  - Z-axis stroke expansion to 400mm improves approach to the machining point when indexing fixture is used
  - Less interference of Z-axis cover for the large fixture

<table>
<thead>
<tr>
<th>Item</th>
<th>U-D14S/B5ADV</th>
<th>U-D14M/B5ADV</th>
<th>U-D21S/B5ADV</th>
<th>U-D21M/B5ADV</th>
<th>U-D14L/B5ADV</th>
</tr>
</thead>
<tbody>
<tr>
<td>X-axis travel</td>
<td>300 mm</td>
<td>500 mm</td>
<td>700 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y-axis travel</td>
<td>300 mm + 100 mm</td>
<td>400 mm</td>
<td>400 mm</td>
<td></td>
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<tr>
<td>Z-axis travel</td>
<td></td>
<td></td>
<td>400 mm</td>
<td></td>
<td></td>
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<tr>
<td>Max. fixture size(X)*</td>
<td>640 mm</td>
<td>1050 mm</td>
<td>1400 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. fixture size(Y)*</td>
<td>520 mm</td>
<td>620 mm</td>
<td>620 mm</td>
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</table>

* Maximum size without interference in full stroke of the axis. Piping and cables of the fixture are included.
  When the fixture is equipped on the table, following points must be kept.
  - The fixture load must be put uniformly on the entire table surface
  - Heavy unit must be kept inside of table area

- Table load capacity 400kg *
  - Max. table load capacity is enhanced
  - Applicable to large fixture and workpiece with the expansion of machining area
    * Max 200kg for α-D14Si/B5ADV/D21Si/B5ADV

- High column (option) *
  - Column raising depends on fixture is applicable
  - Available up to 400mm for wide range of application
    * Max 200mm for α-D14Si/B5ADV/D21Si/B5ADV

High column 400mm spec.
Excellent chip countermeasure

- Y-axis front mountain-shaped telescopic cover *
  - Smooth coolant flow improves chip evacuation
  - Enhanced covering against chips and coolant
    * Except for α-D14SiB5/ADV/D21SiB5/ADV

- X-axis telescopic cover with 3 pieces *
  - 3 pieces cover is applied as standard
  - Reduction of the impact by 3 pieces structure
    enhances durability of cover and cushion rubber
    * Except for α-D14SiB5/ADV/D21SiB5/ADV

- Z-axis metal cover
  - High durability metal cover is applied as standard
  - Exclusive design for advanced version achieved
    less interference

Chip evacuation comparison (700cc block machining) *1

<table>
<thead>
<tr>
<th>Block material</th>
<th>Amount of remaining chips</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standard version *2</td>
</tr>
<tr>
<td>Aluminum</td>
<td>140 g</td>
</tr>
<tr>
<td>Steel</td>
<td>1240 g</td>
</tr>
</tbody>
</table>

*1 Test result under FANUC’s test condition
*2 with normal flood coolant (option)
*3 with high power flood coolant with wall flush (option)

- Enhanced cover around spindle motor (option)*
  - Certain separation of spindle mechanism
    from machining area protects intrusion of
    chips and coolant and achieves high
    sustainability
  * Basic top cover (option) is necessary

- Cleaning unit for tool taper shank (option)
  - Flushing the tool taper shank by coolant
    during tool change to prevent catching
    chips on the spindle taper
  - Stable machining accuracy can be maintained
Features of Advanced version

Cycle time reduction

● Servo turret
  - Tool change time reduction and reliability enhancement by applying new indexing unit driven by servo motor
  - Fastest tool change time 0.7s (Tool to Tool)
  - Shorter than ROBODRILL DI/A series by 0.2s
  - Max. tool weight 4kg setting enables larger cutting tool application

<table>
<thead>
<tr>
<th>Tool change time</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Tool to Tool / Cut to Cut)</td>
</tr>
<tr>
<td>2 kg setting</td>
</tr>
<tr>
<td>0.7s / 1.3s</td>
</tr>
</tbody>
</table>

● Overlap of the ATC and table motion
  - Achieving cycle time reduction by overlapping tool change motion and table positioning

<table>
<thead>
<tr>
<th>Tool change time comparison (Tool change + Table positioning) *</th>
</tr>
</thead>
<tbody>
<tr>
<td>without overlap</td>
</tr>
<tr>
<td>------------------</td>
</tr>
<tr>
<td>1.3s</td>
</tr>
<tr>
<td>0.7s</td>
</tr>
</tbody>
</table>

* Test result with table motion 500mm
  Tool change time is tool to tool

● Application example of cycle time reduction
  - Enhancing the speed performance of ROBODRILL by the combination of servo turret, overlapping functions and DDR-Ti

Example of indexing application by DDR-Ti³

-13.8 s (-13.1 %)

<table>
<thead>
<tr>
<th></th>
<th>DDR-Ti³ ADV</th>
</tr>
</thead>
<tbody>
<tr>
<td>α-D21L A5</td>
<td>105.5 s</td>
</tr>
<tr>
<td>α-D21L B5</td>
<td>91.7 s</td>
</tr>
</tbody>
</table>
FANUC ROBODRILL DDR♭

- High-speed and high-precision additional 1-axis rotary table DDR♭ (option)
  - Synchronous built-in servo motor and αiCZ sensor provide non-backlash, high-speed and high-precision machining
  - Rigidity enhancement by optimizing the shape of casting body
  - Achieving quicker action and higher clamp torque by new clamp mechanism

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive system</td>
<td>Direct drive</td>
</tr>
<tr>
<td>Maximum torque</td>
<td>275 N·m</td>
</tr>
<tr>
<td>Maximum speed</td>
<td>200 min⁻¹ (300 min⁻¹ *)</td>
</tr>
<tr>
<td>Feedrate</td>
<td>1'/min to 30000'/min</td>
</tr>
<tr>
<td>Least input increment</td>
<td>0.001' (IS-C : 0.0001')</td>
</tr>
<tr>
<td>Index accuracy</td>
<td>±0.0028° (± 10°)</td>
</tr>
<tr>
<td>Clamp system</td>
<td>Pneumatic cylinder and spring</td>
</tr>
<tr>
<td>Clamp torque</td>
<td>700 N·m (at 0.5 MPa)</td>
</tr>
<tr>
<td>Max. loading capacity</td>
<td>100 kg</td>
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<tr>
<td>Allowable moment load</td>
<td>Projecting distance x Load = 600 N·m</td>
</tr>
<tr>
<td>Center height</td>
<td>150 mm</td>
</tr>
<tr>
<td>Mass of unit</td>
<td>80 kg</td>
</tr>
</tbody>
</table>

* When loading capacity less than 25kg and loading inertia less than 0.25 kg·m²

- Trunnion unit with DDR♭ and support spindle for quick setup of indexing fixture DDR-T♭ (option)
  - Making the best use of ROBODRILL’s working space
  - Enhancing rigidity and loading capacity by optimizing the shape of casting body
  - Achieving higher clamp torque by new clamp mechanism of support spindle

<table>
<thead>
<tr>
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</tr>
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</table>
| DDR-T♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭♭blas

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High Performance of Machining

Wide variety of high speed and high power spindle

- High speed and high power spindle
  - High rigidity mechanism and outstanding rigidity of main spindle enabling excellent ability in milling in addition to drilling and tapping
- Optimum spindle selectable according to application
  - Standard spindle: Applicable to wide range machining use
  - High torque spindle: Applicable to heavy machining of steel parts
  - High acceleration spindle: Applicable to high speed and high efficiency machining of aluminum parts
  - High speed spindle: Applicable to smooth surface machining

<table>
<thead>
<tr>
<th>Spindle spec.</th>
<th>Max. speed</th>
<th>Tool taper spec.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>BT (BT30)</td>
</tr>
<tr>
<td>Standard</td>
<td>10000 min⁻¹</td>
<td>BIG-PLUS (BT30)</td>
</tr>
<tr>
<td>High torque</td>
<td></td>
<td>DIN (DIN69871-A30)</td>
</tr>
<tr>
<td>High acceleration</td>
<td></td>
<td>NC5 (NC5-46)</td>
</tr>
<tr>
<td>High speed</td>
<td>24000 min⁻¹</td>
<td></td>
</tr>
</tbody>
</table>

*Center through coolant option is available for all spindle spec.
Withstand pressure: 7MPa (NC5: 5MPa)

Standard spindle

High torque spindle

High acceleration spindle

High speed spindle
High speed machining

- Smart overlap function
  - Achieving cycle time reduction by overlapping on the transition between rapid traverse and cutting feed
  - Easy setting by selecting ON/OFF on the screen

High precision and fine surface machining

- Latest CNC and Servo functions
  - SERVO HRV+ control
  - Achieving high responsiveness by optimized electrical control
  - Latest AC Servo Motor
  - Applying the latest AC Servo Motor which provides more smoother feed
  - Least input increment 0.1 μm (IS-C)
  - Addition of setting for least unit 0.1 μm for program command
  - Achieving higher surface quality and improvement of circularity and so on, by applying each function

Stable machining

- AI thermal displacement compensation function
  - Real time compensation by estimating the thermal displacement along each axis based on the operation status of the spindle and feed axes
  - By using touch probe (option), compensation effect adjustment can be performed automatically from the measurement result
  - By using temperature sensors (option), more accurate compensation can be achieved.
  - Even if some of sensors got trouble, sensor check function will keep proper compensation.
Minimizing Down Time

Complete operation management

**ROBODRILL-LINKi** (PC software)
- Operation condition monitoring system
  - Real time display of the entire production area helps to understand the condition of each machine at once
  - Supporting improvement of machine utilization by collecting and visualizing each machine’s information
- Automatic collection of achievement and history
  - Operation achievement data for each machine are collected and displayed in the graph
- Easy introduction
  - The system can be built with general PC and no server PC is required
- Useful tools for management of ROBODRILLS
  - Collecting ROBODRILL’s additional information such as periodical maintenance data, tool life, etc.
  - NC program can be transferred to multiple ROBODRILLS simultaneously

High maintainability

- Information center
  - Alarm messages and their detailed information are displayed
  - Cause of alarm can be identified from the detailed information
- Improvement of maintainability for I/O device
  - Cause and point of the failure of I/O devices (disconnection, earth fault etc.) are identified
  - The facility availability ratio is improved due to the reduction of down time
High reliability

- Abundant track records at FANUC in-house factory
  - Using ROBODRILLS for both steel and aluminum parts machining at FANUC in-house factory
- Applying maintenance data of FANUC in-house factory
  - Accumulating maintenance data of ROBODRILL obtained at FANUC in-house factory
  - Achieving high reliability by returning the maintenance data to ROBODRILL design

Complete preventive maintenance

- Maintenance information management
  - Monitoring the condition of maintenance items and announcing the abnormality or maintenance timing to support effective periodical maintenance
  - Possible to set customized maintenance items (Max. to 10)
- Leakage Detection Function
  - Early detection of insulation resistance drop of each motor and motor power cable
  - Enable preventive maintenance before breakdown
- Fan Monitor Function
  - Monitoring cooling fans of CNC, Servo Amplifiers, Spindle Amplifier and Power Supply
  - Announcing before failure when the rotation speed of the cooling fans is dropping
  - Easy to detect the abnormal fan

Machine configuration to improve parts replacement

- New fan motor units are applied for easy parts replacement
- The facility availability ratio is improved due to the reduction of maintenance time

RECHARGEABLE BATTERY UNIT (option)

- Supplying backup power both CNC and PULSECODER instead of disposable battery
- Automatically recharged while ROBODRILL power ON
- Battery maintenance free
Ease of Use

The latest CNC of FANUC

● 10.4” Color LCD with $i\text{HMI}$
  • Intuitive and operable interface by $i\text{HMI}$
  • Easy operation on programming, setup and machining
  • Seamless flat display unit achieves tolerance to coolant oil resistant and designability

● Operator’s panel
  • Improving operability and visibility by renewing key layout and indicators
  • Unity design with CNC display unit

High usability

● Easy to use screens from programming to maintenance
  • CNC operation screen
    Operable screen structure arranged by operation steps of “programming”, “setup” and “machining”
    Graphical display enhances visibility
  • Machine operation setting screen
    Parameters related with work load, machining mode and energy saving can be switched easily according to applications
  • Restoration screen
    Particular maintenance of ROBODRILL such as turret restoration or motor reference position recovery can be performed easily

● Integrated operation, programming guidance
  (\textit{MANUAL GUIDE} $i$)
  • Easy to program and operate machining on one screen
  • Easy to program with G code through graphic guide
  • Simple machining simulation of solid model

CNC operation

Machine operation setting

Machining cycle input
Automation application

- Quick and Simple Startup of Robotization (QSSR) (option)
  - Useful package of robot, robot base, auto side door, connecting cables, sample programs, easy setting function etc.
  - Easy to introduce robot system
- Robot interface 2 (option)
  - Reducing cables and keeping safety by FL-net function
  - Robot manual operation is available on the ROBODRILL screen
  - ROBODRILL manual operation is available on the Robot teach pendant

High expandability

- External interface function
  - General I/O signals such as external start are ready to use only by selecting settings
  - Lighting conditions of signal lamps can be set on the screen
- Custom control panel
  - On screen switches (ON/OFF or pulse) and indication lamps can be created
  - Peripheral devices are operated without integrating control panel hardware
  - Flexible and cost saving solution for simple system integration
- Custom PMC function
  - LADDER program to control peripheral devices can be created and monitored on screen
  - Number of I/O signals can be expanded
    - Standard: Input 16 / Output 16
    - Max: Input 1024 / Output 1024 (option)

Technology for power saving

- Proven power regeneration function
  - The power regeneration function that use regenerating energy occurred on deceleration of motors has been adopted since 1994.

Conformity of safety standards

- Conformity of each country’s safety standard (option)
Machining Capability

Machining sample (These data may change by machining conditions)

<table>
<thead>
<tr>
<th>Spindle spec.</th>
<th>Standard spindle</th>
<th>High torque spindle</th>
<th>High acceleration spindle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machining Material</td>
<td>Tool dia.(mm) x Feed(mm/rev)</td>
<td>Drilling Tool dia.(mm) x Feed(mm/rev)</td>
<td>Tapping Tap size x Tap pitch(mm)</td>
</tr>
<tr>
<td>Carbon Steel C45</td>
<td>φ30 x 0.10 M20 x 2.5</td>
<td>φ30 x 0.15 M20 x 2.5</td>
<td>φ20 x 0.10 M16 x 2.0</td>
</tr>
<tr>
<td>Grey Cast Iron</td>
<td>φ30 x 0.25 M27 x 3.0</td>
<td>φ30 x 0.30 M27 x 3.0</td>
<td></td>
</tr>
<tr>
<td>Aluminum Alloy Die Casting</td>
<td>φ32 x 0.35 M30 x 3.5</td>
<td>φ32 x 0.40 M30 x 3.5</td>
<td>φ22 x 0.25 M24 x 3.0</td>
</tr>
</tbody>
</table>

Available Options

- Top cover
- Coolant unit (tank)
- LED Illumination
- Tool length switch for automatic measurement

Coolant unit with chip flush (spot gun provided)

Automatic Grease Lubricating System (LHL Liquid Grease)

Automatic Oil Lubricating System

Touch probe

(Note)
- The machine life may be shortened depending on the workpiece, tool, coolant, or lubricant to be used.

Maintenance and Customer Support

Worldwide Customer Support and Service

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 ACADEMY

FANUC ACADEMY operates training programs on FANUC ROBODRILL which focus on practical operations and programming with machining knowledge and maintenance.

Inquiries : Oshino-mura, Yamanashi, Japan 401-0597
Phone : 81-555-84-6030  Fax : 81-555-84-5540
Outer Dimensions and Floor Plan

\[ \alpha-D21SiB5_{\text{ADV}} / D14SiB5_{\text{ADV}} \]

\[ \alpha-D21MiB5_{\text{ADV}} / D14MiB5_{\text{ADV}} \]

\[ \alpha-D21LiB5_{\text{ADV}} / D14LiB5_{\text{ADV}} \]

\[ \alpha-D21LiB5_{\text{ADV}} / D14LiB5_{\text{ADV}} \]

*1 These dimensions may vary on some options. (For further details, please contact FANUC.)
## Specification

<table>
<thead>
<tr>
<th>Item</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Machine (Standard)</strong></td>
<td><strong>C-D281/S5 ADV</strong></td>
<td><strong>C-D21M/S5 ADV</strong></td>
<td><strong>C-D21L/S5 ADV</strong></td>
</tr>
<tr>
<td><strong>Capacity</strong></td>
<td><strong>X-axis travel (longitudinal movement of table)</strong></td>
<td>300 mm</td>
<td>500 mm</td>
</tr>
<tr>
<td></td>
<td><strong>Y-axis travel (cross movement of saddle)</strong></td>
<td>300 mm + 100 mm</td>
<td>400 mm</td>
</tr>
<tr>
<td></td>
<td><strong>Z-axis travel (vertical movement of spindle head)</strong></td>
<td>400 mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Distance from table surface to spindle gage plate</strong></td>
<td>80 mm to 480 mm (when no high column is specified)</td>
<td></td>
</tr>
<tr>
<td><strong>Table</strong></td>
<td><strong>Working space (X-axis \times Y-axis)</strong></td>
<td>630 mm \times 330 mm</td>
<td>650 mm \times 400 mm</td>
</tr>
<tr>
<td></td>
<td><strong>Capacity of workpiece mass</strong></td>
<td>200 kg (uniform load)</td>
<td>400 kg (uniform load)</td>
</tr>
<tr>
<td></td>
<td><strong>Working surface configuration</strong></td>
<td>3 × T-slots size 14 mm pitch 125 mm</td>
<td></td>
</tr>
<tr>
<td><strong>Spindle</strong></td>
<td><strong>Speed range</strong></td>
<td>100 min⁻¹ to 10000 min⁻¹ / 240 min⁻¹ to 24000 min⁻¹ (option)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Spindle gage (call number)</strong></td>
<td>7/24 taper No.30 (with air blow)</td>
<td></td>
</tr>
<tr>
<td><strong>Feedrate</strong></td>
<td><strong>Rapid traverse rate</strong></td>
<td>54 m/min (X,Y,Z)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Feedrate</strong></td>
<td>1 mm/min to 30000 mm/min</td>
<td></td>
</tr>
<tr>
<td><strong>Turret</strong></td>
<td><strong>Type of tooling</strong></td>
<td>JIS B 6339-2011 BT30, MAS 403-19B2 P30-T1 (45°)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Tool storage capacity</strong></td>
<td>21 tools: α-D21/S5 ADV/D21M/S5 ADV/D21L/S5 ADV 14 tools: α-D14/S5 ADV/D14M/S5 ADV/D14L/S5 ADV</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Maximum tool diameter</strong></td>
<td>80 mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Maximum tool length</strong></td>
<td>200 mm: α-D14/S5 ADV 190 mm (changed by specifications): α-D21/S5 ADV</td>
<td>250 mm</td>
</tr>
<tr>
<td></td>
<td><strong>Method of tool selection</strong></td>
<td>Random shortest path</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Maximum tool mass</strong></td>
<td>2 kg/tool (total mass 23 kg) / 3 kg/tool (total mass 33 kg) / 4 kg/tool (total mass 46 kg): 21 tools 2 kg/tool (total mass 15 kg) / 3 kg/tool (total mass 22 kg) / 4 kg/tool (total mass 30 kg): 14 tools</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Tool changing time (Tool to Tool) (Cut to Cut)</strong></td>
<td>0.7 s (2 kg/tool) / 0.9 s (3 kg/tool) / 1.1 s (4 kg/tool) 1.3 s (2 kg/tool) / 1.5 s (3 kg/tool) / 1.7 s (4 kg/tool)</td>
<td></td>
</tr>
<tr>
<td><strong>Motors</strong></td>
<td><strong>Spindle drive motor</strong></td>
<td>11.0 kW (1 minute rating)/3.7 kWh (continuous rating) (changed by specifications)</td>
<td></td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td><strong>Bidirectional accuracy of positioning of an axis (ISO230-2:1998)</strong></td>
<td>Less than 0.006 mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Bidirectional repeatability of positioning of an axis (ISO230-2:1997, 2006)</strong></td>
<td>Less than 0.004 mm</td>
<td></td>
</tr>
<tr>
<td><strong>Sound pressure level</strong></td>
<td><strong>Control unit</strong></td>
<td><strong>Model</strong></td>
<td><strong>FANUC Series 31i/5B</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Power source</strong></td>
<td>Power supply</td>
<td>200 Vac, to 220 Vac, -15 % to +10 %, 3-phase, 50 Hz ± 1 Hz or 60 Hz ± 1 Hz 10 kVA</td>
</tr>
<tr>
<td></td>
<td><strong>Compressed air supply</strong></td>
<td>0.35 MPa to 0.55 MPa (0.5 MPa is recommended) (gage pressure) 0.15 m³/min (at atmospheric pressure)</td>
<td></td>
</tr>
<tr>
<td><strong>Machine size</strong></td>
<td><strong>Machine height</strong></td>
<td>2236 mm + 10 mm (when no high column is specified)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Floor space</strong></td>
<td>995 mm \times 2220 mm</td>
<td>1615 mm \times 2050 mm</td>
</tr>
<tr>
<td></td>
<td><strong>Mass of machine</strong></td>
<td>Approx. 2150 kg</td>
<td>Approx. 2200 kg</td>
</tr>
</tbody>
</table>

*1 Positioning accuracy is the adjusted and measured value in compliance with applicable standard at FANUC’s factory. Depending on an influence of JIG & workpiece mass on table, the use conditions and installation environment, there may be a case where the accuracy shown in this catalog may not be achieved.

*2 Sound pressure level is measured in compliance with FANUC’s own regulation. Depending on the use conditions and installation environment, there may be a case where the sound pressure level shown in this catalog may not be achieved.

*3 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.

*4 In case of center through coolant and cleaning unit for tool taper shank, additional +1 kVA 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 10mm² or more should be used at primary power connection.

*5 In case of center through coolant, additional + 0.05m³/min is required. In case of air blow for chips, additional + 0.2m³/min is required. In case of side automatic door, 0.4MPa compressed air supply or more is required.

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**FANUC CORPORATION**
Oshino-mura, Yamanashi 401-0597, Japan Phone: 81-555-84-5555 Fax: 81-555-84-5512 http://www.fanuc.co.jp

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