High-Reliability and High-Performance Wire-cut Electric Discharge Machine

FANUC
ROBOCUT α-CIB series
High-Reliability and High-Performance Wire-Cut Electric Discharge Machine

**FANUC ROBOCUT α-CiB series**

**High Performance of Cutting**
- High speed, High precision, High quality
- Stable cutting
- Wide range of applications

**Minimizing Downtime**
- High reliability
- High maintainability

**Ease of Use**
- Superior operability
- Fulfilling EDM technologies
- Various automatic functions

**Applying the latest CNC & servo technology**

**Good combination with FANUC Robot**
High Performance of Cutting

New discharge control iPulse2 and cutting power supply provides high speed, high precision, and high quality cutting
AI thermal displacement compensation function and various shape compensation functions provide stable and accurate cutting
High precision rotary table, ROBOCUT CCR extends the range of applications

Minimizing Downtime

High reliable auto wire feeding (AWF3) provides continuous unmanned machining
Consumables management function and Maintenance guidance function support routine maintenance
ROBOCUT-LINK provides production and quality information management

Ease of Use

New user interface iHMI provides various CNC screen functions
Fulfilling EDM technologies support high speed, high precision, and high quality cutting
Automatic functions support set-up operations

α-C400iB
XYZ axis travel
400×300×255 mm

α-C600iB
XYZ axis travel
600×400×310 mm
600×400×410 mm (Option)

α-C800iB
XYZ axis travel
800×600×310 mm
800×600×510 mm (Option)

* The outer view will be different as machine specifications
High Performance of Cutting

New discharge control iPulse2 and cutting power supply providing high speed, high precision and high quality cutting

- New discharge control iPulse2 realizes high precision cutting by keeping discharge gap constant according to discharge status and cutting shape
- Improves corner accuracy, surface finish, and cutting speed

High speed, high precision, and high quality cutting performance by iPulse2

- iPulse2 and SF2 (Standard power supply for skim cutting) provide surface roughness Ra0.30 μm with die steel less than 60mm thickness

<table>
<thead>
<tr>
<th>Previous</th>
<th>iPulse2</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Diagram" /></td>
<td><img src="image2.png" alt="Diagram" /></td>
</tr>
</tbody>
</table>

- Over cut
- High precision

Cutting example: iPulse2 & SF2

<table>
<thead>
<tr>
<th>Material</th>
<th>Diameter</th>
<th>Cutting Type</th>
<th>Accuracy</th>
<th>Surface Roughness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Die steel</td>
<td>50mm</td>
<td>Standard 4 times cutting</td>
<td>±0.3μm</td>
<td>Ra0.30 μm</td>
</tr>
</tbody>
</table>

Best surface roughness cutting by MF2 (Option)

- MF2 (Optional Power Supply for Skim cutting) achieves the best surface roughness Ra0.10 μm for the tungsten carbide less than 30mm thickness

Cutting example: MF2

<table>
<thead>
<tr>
<th>Material</th>
<th>Diameter</th>
<th>Cutting Type</th>
<th>Accuracy</th>
<th>Surface Roughness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tungsten carbide</td>
<td>30mm</td>
<td>Best surface roughness</td>
<td>9 times cutting</td>
<td>Ra0.10 μm</td>
</tr>
</tbody>
</table>

High accuracy thick work - piece cutting by iPulse2

- High precision cutting for thick work-piece

Cutting example: iPulse2 & SF2

<table>
<thead>
<tr>
<th>Material</th>
<th>Diameter</th>
<th>Cutting Type</th>
<th>Accuracy</th>
<th>Surface Roughness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Die steel</td>
<td>40mm/300mm</td>
<td>High speed 3 times cutting</td>
<td>±3.0μm</td>
<td>Ra0.50 μm</td>
</tr>
</tbody>
</table>

- All cutting results obtained under FANUC-designated conditions
AI thermal displacement compensation function provides stable and accurate cutting

- Advanced thermal displacement compensation by multiple sensors
- With AI (Machine learning), stable cutting can be realized even the large temperature change happens
- Optimizes the amount of compensation depending on the user environment

Higher pitch accuracy by high rigid casting and high accuracy pitch error compensation

High rigid casting by symmetry-designed
- Optimization of casting by the latest analysis tools
- Improvement of casting rigidity by utilizing design for heavy load

High accuracy pitch error compensation function
- Compensates pitch error over the entire cutting area by grid pattern.

High precision rotary table, ROBOCUT CCR, extends the range of applications (Option)

ROBOCUT CCR
- FANUC Servo motor and rotary encoder provides high precision positioning
- Light weight and compact size

Examples using PCD tool cutting
- PCD tool Cutting with ROBOCUT CCR
Minimizing Downtime

Auto wire feeding AWF3 providing unmanned machining

- An air jet transport system has been adopted to the upper pipe unit, which realizes high reliability and high threading-rate of wire
- AWF3 achieves to thread the wire to the max.500mm thickness and also provides AWR (Automatic Wire Recovery) with 150mm work-piece thickness in submerge

Simple design of upper guide unit

- Various AWF functions supports strongly unmanned machining

Air retry

Higher success rate of threading wire by intentional wire vibration. Possible to thread wire even in difficult situation such as wire break point or small start hole.

Twin servo wire feeding system

Wire feeding system with twin FANUC servo motors accurately controls wire tension and suppresses wire vibration to achieve high precision cutting.
Core adhesion function by CORE STITCH®

- The core is adhered by welding brass of wire
- Time reduction of the process for cutting the core off
- Prevention of the machine damage by the fallen core

Core adhesion

Adhesion by brass material

Pre-seal mechanism for high reliability

Pre-seal Mechanism

- Pressurized clean water tank prevents the sealing plate from sludge that adheres to it
- Prevents deterioration of cutting accuracy caused by the increased frictional resistance

Cutting tank (Dirty water)

Seal plate

Two-Split Transparent Seal Plates

- Easy to disassemble and clean
- Easy to check how dirty

Parts list function and maintenance guidance function

Consumable management Function
- Monitoring of consumables’ lives

Maintenance Guidance Function
- Easy to understand the routine maintenance with pictures and figures

Parts List Function
- Search for maintenance parts

ROBOCUT-LINK™ provides production and quality information management

- Monitoring of cutting status in real time
- High speed transfer of NC program

Max. 32 units

Send emails to cellular phone

Operation monitor

Consumables’ lives

Regular services

*OS: Microsoft® Windows® 7 / 8 / 8.1 / 10 **It’s necessary to contract with provider to use mail function.

*CORE STITCH is a registered trademark of Seibu Electric & Machinery Co., Ltd.
Ease of Use

FANUC latest user interface iHMI provides various CNC screen functions

Home screen
- Adopt iHMI home screen

Manual viewer
- Referring to the manual on the CNC screen

PC operation
- Remote desktop connection with ROBOCUT-CAMi

Simple Adjustment Function of EDM Technologies to support stable cutting

- Simple adjustment in case wire break happens
- Simple adjustment by touching CNC screen
- EDM Technologies are adjustable from NC program

FANUC CNC and operation guidance provide easy user friendly operations

AI Setting Screen
- Selectable optimal EDM technologies depending on the cutting applications

Setup Guidance Function
- Displaying the setup procedure step by step

Positioning Function
- Measuring the shape of the work-piece and positioning through the guidance

QSSR : Quick and Simple Startup of Robotization (Option)

QSSR : Quick and Simple Startup of Robotization
- Packaging FANUC Robot, Robot interface, Robot stand, safety fence, Robot sample program, and so on
- QSSR easily provides the installed system which exchanges the work-piece by FANUC Robot

Handling the work-piece (220 x 190 x 50 [mm], 25kg or less)

Work-piece holder

Work-piece exchange cell with Robot
Automatic function supporting the setup operation (Option)

**Smart Programming Function**
- Easy programming for the keyway cutting

![Smart Programming Function Image](image)

**3D Coordinate System Rotation Function**
- Compensates the program coordinate automatically in 3D as the slope of the work-piece

![3D Coordinate System Rotation Function Image](image)

**Probe Measurement Function**
- Measuring the shape of work-piece on the machine with a touch probe

![Probe Measurement Function Image](image)

**ROBOCUT-CAMI** (Option)
- Easy operation to make NC programs for standard cutting, taper cutting, different profiles in the top and the bottom cutting, gear shape cutting, CORE STITCH, and so on for ROBOCUT
- Easy operation to make cutting path from CAD data or NC programs
- Standard EDM technologies for ROBOCUT are being registered

![ROBOCUT-CAMI Option Image](image)

NC programs

- USB stick
- CF card
- Ethernet

*OS: Microsoft® Windows® 7 / 8 / 8.1 / 10*
Various Options

- Linear encoder
- MF2 power supply for skim cutting
- PCD tool cutting system
- Double door
- Automatic door
- 45° Taper cutting kits
- Work light (LED)
- Warning light (Three-stage LED with buzzer)
- Auto grease lubrication
- Removable table (α-C400iB)
- 20 to 30kg Wire loader

*The availability of options is different, depending on the country, region, model. Please contact FANUC.*

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 ROBOCUT which focus on practical operations and programming with cutting know how and maintenance.
Outer Dimensions and Floor Plan

**α-C400iB**

**α-C600iB**

**α-C800iB**

Installing Conditions

| Power supply | 200VAC±10% 3-phase 50/60Hz ±1Hz  
|              | 220VAC±10% 3-phase 60Hz ±1Hz  
|              | Connection cable terminal size : B-S  
|              | Power consumption : 13kVA  
| Air supply   | Pressure : 0.5 to 0.7 MPa  
|              | Flow rate : 100L / min or more  
|              | : 120L / min or more (with a thin wire option)  
|              | *Regulator-side coupler mounting screw : Rc1/4  
| Shield room  | If discharge noise can interfere with surrounding  
|              | radio, television and other sets, a shield room  
|              | needs to be created  
| Environment  | Ambient temperature : 15 to 30°C  
|              | *Recommend 20±1°C for high precision machining.  
|              | Install under the oil mist free and dust free environment.  
|              | Humidity : 75%RH or less  
| Grounding    | The unit must be grounded to prevent damage resulting from  
|              | electro-magnetic interference or electrical leakage.  
|              | The unit is recommended to be installed so that the ground resistance  
|              | is less than 10Ω.  
|              | Also, the grounding should be isolated from other machines.  

* The values in parentheses ( ) are for thin wire or auto grease lubrication option.  
* The values in parentheses <> are when the safety cover is open.  
* The above floor plan is that of a standard type machine. Contact FANUC if you wish to order the options such as a Z axis travel 410mm, 510mm and 30kg wire loader.
# Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>$\mathbf{\times-C400iB}$</th>
<th>$\mathbf{\times-C600iB}$</th>
<th>$\mathbf{\times-C800iB}$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maximum workpiece dimensions</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>without Automatic door</td>
<td>Z axis travel standard</td>
<td>730 x 630 x 250 mm</td>
<td>1050 x 820 x 300 mm</td>
</tr>
<tr>
<td></td>
<td>Z axis travel option</td>
<td>—</td>
<td>1050 x 820 x 400 mm</td>
</tr>
<tr>
<td>with Automatic door</td>
<td>Z axis travel standard</td>
<td>730 x 585 x 250 mm</td>
<td>1050 x 775 x 300 mm</td>
</tr>
<tr>
<td></td>
<td>Z axis travel option</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td><strong>Maximum workpiece mass</strong></td>
<td>500 kg</td>
<td>1000 kg</td>
<td>3000 kg</td>
</tr>
<tr>
<td><strong>XY axis table travel</strong></td>
<td>400 x 300 mm</td>
<td>600 x 400 mm</td>
<td>800 x 600 mm</td>
</tr>
<tr>
<td><strong>Z axis travel</strong></td>
<td>standard</td>
<td>255 mm</td>
<td>310 mm</td>
</tr>
<tr>
<td></td>
<td>option</td>
<td>—</td>
<td>410 mm</td>
</tr>
<tr>
<td><strong>UV axis travel</strong></td>
<td>±60 mm x ±60 mm</td>
<td>±100 mm x ±100 mm</td>
<td>±100 mm x ±100 mm</td>
</tr>
<tr>
<td><strong>Maximum taper angle</strong></td>
<td>standard</td>
<td>±30° / 80 mm</td>
<td>±30° / 150 mm</td>
</tr>
<tr>
<td></td>
<td>option</td>
<td>±45° / 40 mm</td>
<td>±45° / 70 mm</td>
</tr>
<tr>
<td><strong>Wire diameter</strong></td>
<td>standard</td>
<td>φ0.10 to φ0.30 mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>option</td>
<td>φ0.05 to φ0.30 mm</td>
<td>—</td>
</tr>
<tr>
<td><strong>Maximum wire mass</strong></td>
<td>16 kg</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Machine mass (approx.)</strong></td>
<td>1800 kg</td>
<td>3000 kg</td>
<td>4200 kg</td>
</tr>
<tr>
<td><strong>Controller</strong></td>
<td>FANUC Series 31i+-WB</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Acoustic noise level</strong></td>
<td>LPA= 64 dB</td>
<td>LPCpeak= 81 dB</td>
<td></td>
</tr>
</tbody>
</table>