High-Reliability and High-Performance
Wire Electrical Discharge Machine

FANUC

ROBOCUT α-*C*i*C* series

High-Reliability and High-Performance
Wire Electrical Discharge Machine

FANUC ROBOCUT α-C*i*C series

ROBOCUT α-C400*i*C

XYZ axis travel : 400×300×255 mm

ROBOCUT α-C600*i*C

XYZ axis travel : 600×400×310 mm

ROBOCUT α-C800*i*C

XYZ axis travel : 800×600×310 mm

High Performance of Cutting

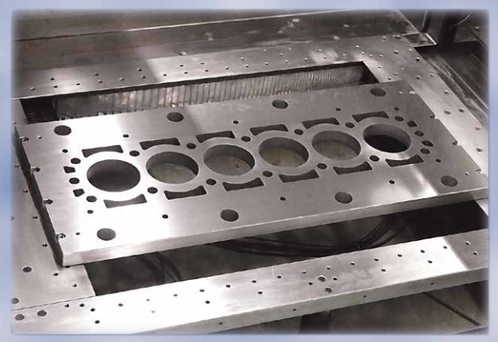
- New mechanical structure and new discharge control to provide high speed, high precision, and high quality cutting
- AI thermal displacement compensation function to provide stable cutting, and various functions to adjust shapes easily
- High precision rotary table ROBOCUT CCR to expand the applications

Maximizing Uptime

- High reliable automatic wire feeding (AWF3) provides continuous unmanned cutting
- Pre-seal mechanism of work tank and wire feeding mechanism provides easy-maintenance
- Wire Saving function provides less running cost

Ease of Use

- FANUC CNC and operation guidance function provide superior operations
- Fulfilling EDM technologies support high speed, high precision, and high quality cutting
- Automatic functions support set-up operations



* The outer view will be different as machine specifications

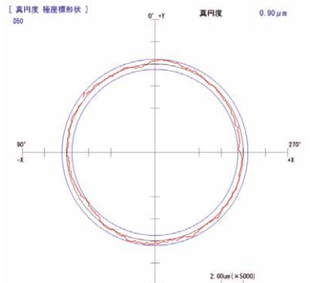
High Performance of Cutting

Mechanical structure to provide high precision cutting

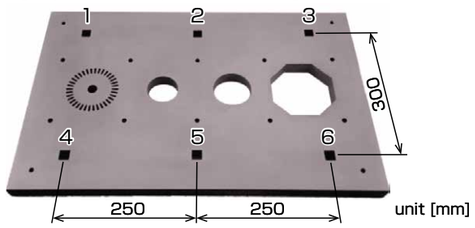
・The enhanced mechanical rigidity will provide high precision cutting such as circle shape, pitch accuracy, and so on.

【High precision cutting of circle shape】

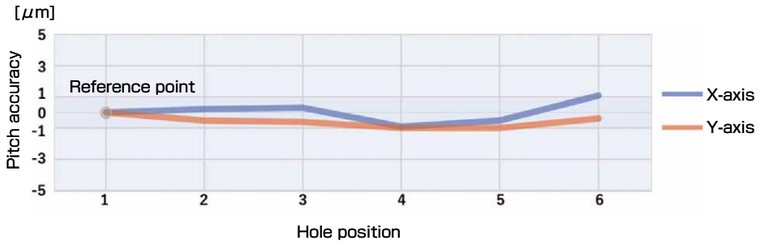
Die steel, 20mm, ϕ0.25 brass wire
1 rough 5 skims
Roundness 0.90μm



【High precision pitch cutting】



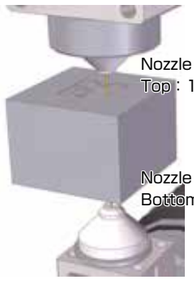
Die steel, 30mm, ϕ0.20 brass wire
1 rough 4 skims, 20mm square holes
Pitch accuracy: +/- 1.1μm



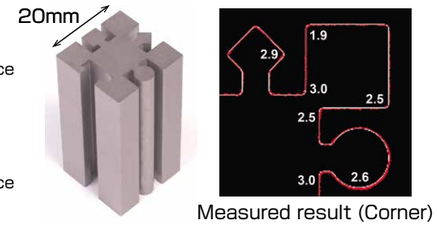
Discharge control *i*Pulse3 to provide high precision cutting

・Discharge control *i*Pulse3 provides high precision cutting even while the nozzle clearance is open.

【Cutting example】

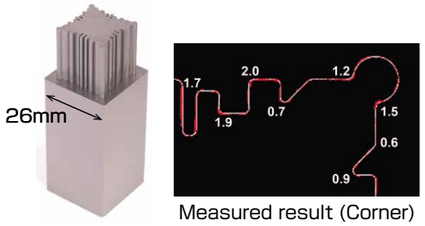


【3 paths】



Measured result (Corner)

【5 paths】



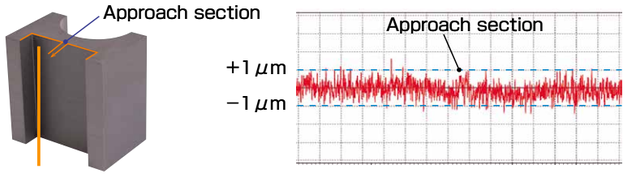
Measured result (Corner)

Die steel, 40mm, ϕ0.25 brass wire, 1 rough
2 skims, Accuracy +/- 3μm, Roughness Ra 0.60μm

Die steel, 50mm, ϕ0.20 brass wire, 1 rough
4 skims, Accuracy +/- 2μm, Roughness Ra 0.28μm

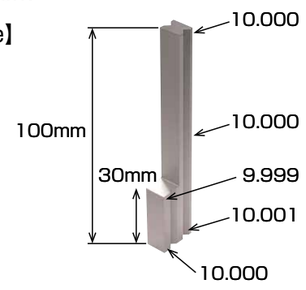
・Less line mark at approach section, Improved accuracy of stepped-shape work

【Cut sample】



Die steel, 30mm, ϕ0.25 brass wire, 1 rough 4 skims
Accuracy +/- 1μm

【Cut sample】



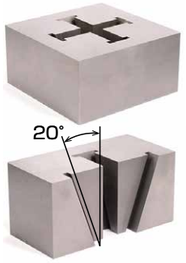
Die steel, 100-30mm, ϕ0.25 brass wire, 1 rough 4 skims
Width accuracy 2μm

* All cutting results obtained under FANUC-designated conditions (Including Machine type).

Various functions and mechanisms to support high precision cutting

Taper adjustment function (Max. 4 directions)

・Simple setup for high precision taper cutting

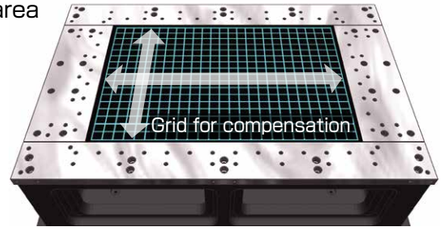


Die steel, 50mm, ϕ0.20 soft wire
1 rough 3 skims
Taper angle 20 degrees

Accuracy (4 directions) +/- 0.01 degrees

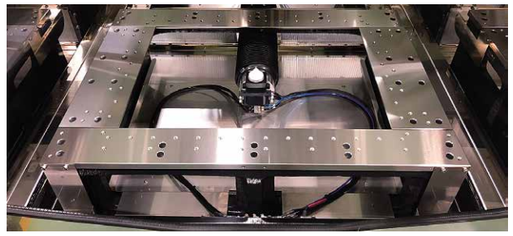
High precision pitch error compensation function

・Corrects the pitch error over the entire table area



Workpiece table (standard installed)

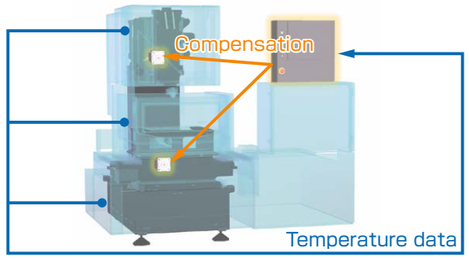
・Durable table to prevent scratch

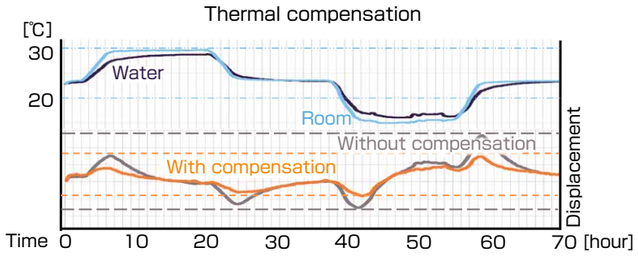


AI thermal displacement compensation function to realize stable cutting

・Multiple temperature sensors and AI (Machine Learning) realize stable cutting even if the temperature around the machine changes on a large scale.

FANUC AI Level 3 Machine Learning





High precision rotary table, ROBOCUT CCR, to expand applications (Option)

ROBOCUT CCR

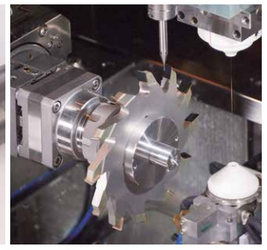
・FANUC Servo motor & rotary encoder are installed

High precision positioning, light weight, and compact rotary table

【Cut sample】
Helical cutting

PCD tool cutting

・PCD tool applications with ROBOCUT CCR



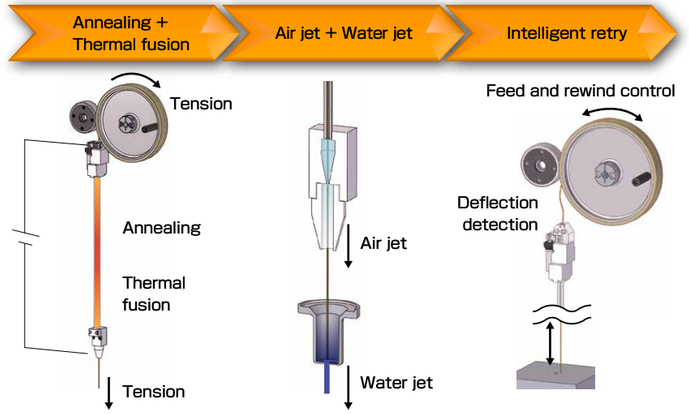
High quality cutting by PCD dedicated power supply

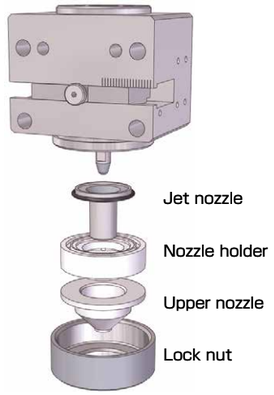
* All cutting results obtained under FANUC-designated conditions (Including Machine type).

Maximizing Uptime

Automatic wire feeding system AWF3 to support unmanned operation

- Simple structure provides a great maintainability, higher rate of wire threading, and high reliability
- Provides AWF for Max.500mm work thickness in submerged condition, AWR with 150mm



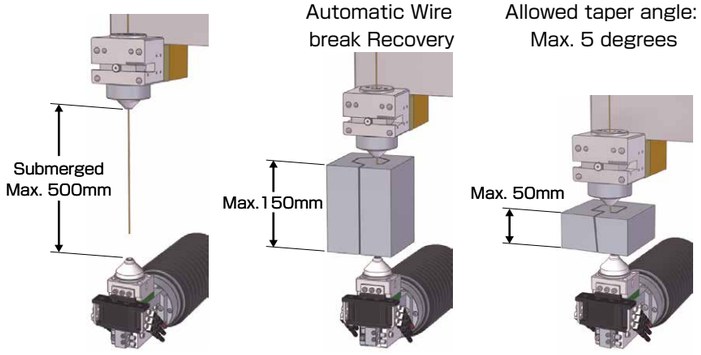


Simplified upper guide unit

AWF

AWR
Automatic Wire break Recovery

Taper AWR
Allowed taper angle: Max. 5 degrees

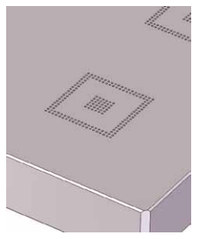


Various AWF functions strongly support the unmanned operations

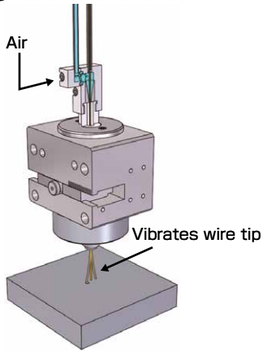
*All AWF obtained under FANUC-designated conditions

Level up performance of AWF

- Improved straightness of wire to shorten time for threading wire into small hole or wire break point while nozzle clearance is open.
- Vibrates wire tip during threading for various cases such as threading wire into shifted start hole or hole with burr inside (called Air Retry)

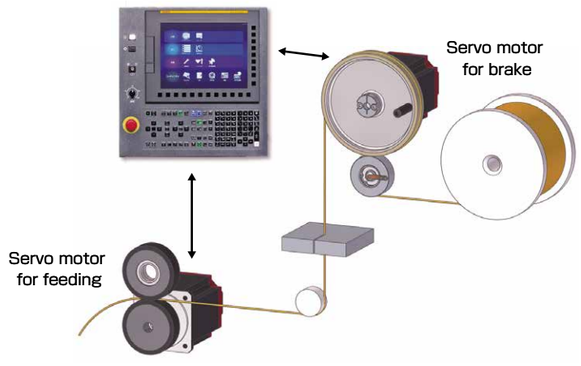


Min. hole size: ϕ0.3mm



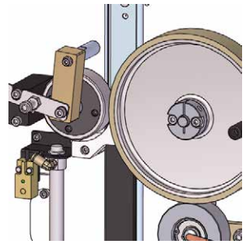
Twin servo wire feeding system

- Wire feeding system by FANUC servo motors accurately controls the wire tension and suppresses the wire vibration to provide high precision cutting

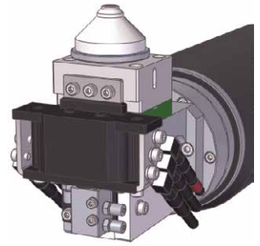


Wire feeding system to contribute for higher capacity utilization

- Simple structure to provide easier wire installation

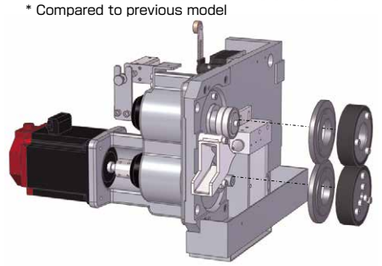


- Maintenance-free structure on the lower guide



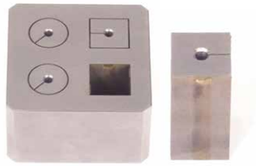
- 50%* shortened maintenance time at wire outlet mechanism

* Compared to previous model

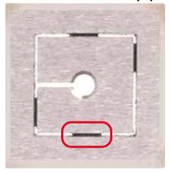


CORE STITCH* function to keep the cores

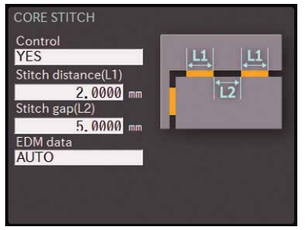
- The function to keep the core by brass adhering provides continuous unmanned operation.
- Prevents the machine damage due to the dropped cores
- Easy operation to activate on the CNC screen
- Easy setting of adhesion distance and gap



Core adhesion and a removed core



Adhesion by brass ingredient

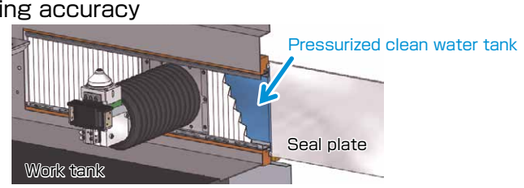


*CORE STITCH is a registered trademark of Seibu Electric & Machinery Co., Ltd.

Pre-seal mechanism of work tank to provide high reliability

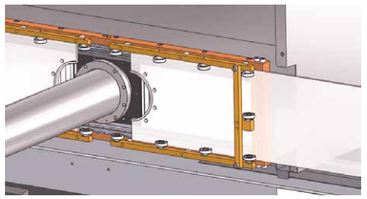
Pre-seal mechanism

- Pressurized clean water tank prevents the seal plates from sludge adhering to it
- Reduces frictional resistance to prevent from deteriorating cutting accuracy



Two-split Transparent seal plates

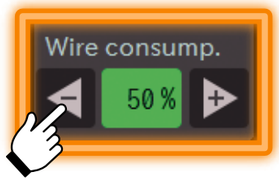
- Easy to disassemble and keep clean
- Easy to check for dirt



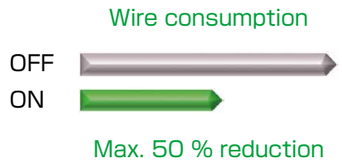
Wire Saving function to reduce running cost

Wire Saving function

- Adjust simply the wire consumption



Reduces wire consumption by up to 50% while the cutting accuracy is kept from the rough cutting to the skim cutting.
Adjustable range: 50% - 100%



*All cutting results obtained under FANUC-designated conditions(Including Machine type).

Ease of Use

Intuitive operation to adjust EDM technologies

Simple adjustment function

・Cutting speed and the shape can be adjusted by simple and intuitive operation

Touching the buttons to adjust the EDM parameters

The cutting speed can be adjusted from 50% to 120% keeping the discharge gap to achieve stable cutting

The buttons to adjust visually at the corner shape and approaching shape without directly changing parameters

Various functions to support daily maintenance

Consumables management

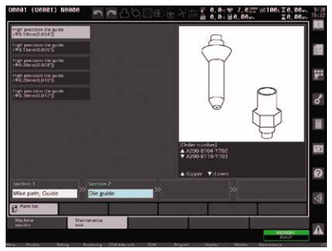
・For monitoring the lives of consumable parts

Maintenance guidance

・Provides the daily maintenance with pictures and drawings.

Parts list

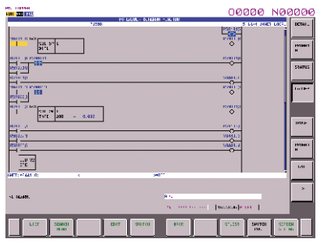
・For searching maintenance parts and ordering information



Customize functions to support user needs

Custom PMC

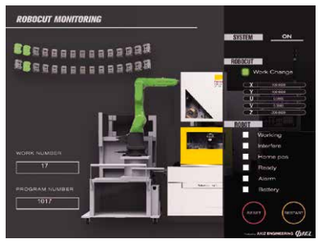
・Sequence programs can be customized



※Standard I/O : 8 points each

Custom screen

・Operational screens can be created



※Designated software is necessary.

ROBOCUT ROBOT Package (Option)

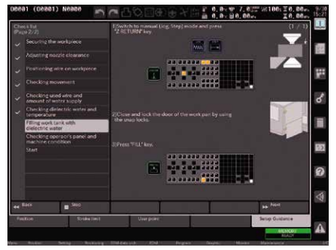
・Packaging FANUC Robot, Robot interface, Robot stand, workpiece stocker, scheduler, and so on
・Easy setup of workpiece exchange system by Robot
・Automation system for high-mix low-volume production

Workpiece exchange system with FANUC Robot (sample)

Various functions to support setting up

Setup Guidance function

・Explains the set up procedure



Searching EDM screen

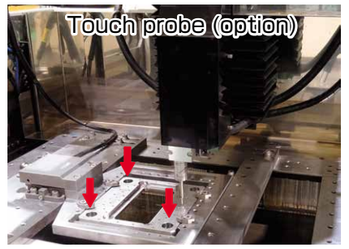
・Provides the proper EDM technologies to each application

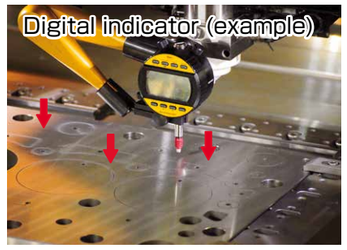
Smart Programming

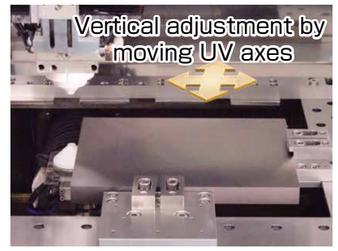
・Simple operation to make NC programs automatically

3D Coordinate Rotation Function

・Compensates the wire vertical position by moving U / V axes according to the workpiece tilt.

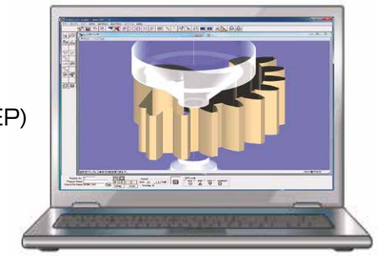






ROBOCUT-CAM*i* (Option)

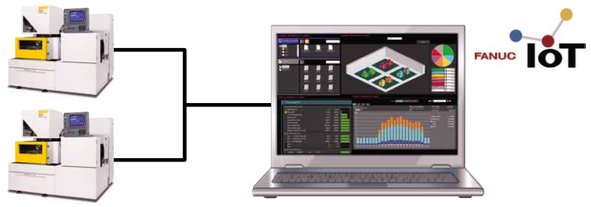
・This is the PC software to create NC programs for ROBOCUT
・Easy operation to make NC programs interactively for standard cutting, taper cutting, different profiles on the top and the bottom cutting, gear shape cutting, CORE STITCH, and so on
・Easy operation to create cutting path from CAD data (DXF,IGES,STEP) and NC programs
・Standard EDM technologies for ROBOCUT are installed
・USB memory and Ethernet can be used when transferring the data between ROBOCUT and the PC



*OS : Microsoft® Windows® 8 / 8.1 / 10 / 11

ROBOCUT-LINK*i* to manage production and quality information

・Monitors the cutting status of ROBOCUT in real time
・High speed transfer of NC programs
・Notifies the job end or alarms to operators by emails



32 units connectable

Overall monitoring

Operation result

Consumables' lives

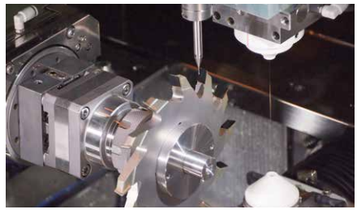
Power consumption monitor

* OS : Microsoft® Windows® 7 / 8 / 8.1 / 10 / 11 ** It's necessary to contract with provider to use email function.

Options

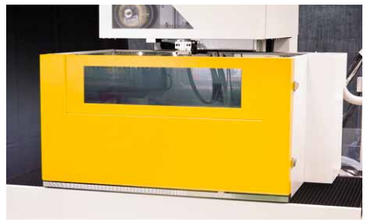
Linear encoder

MF2 power supply for skim cutting



PCD tool cutting system

Double doors



Automatic door

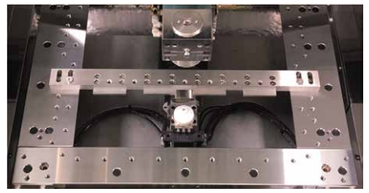
Warning light (Three-stage LED with buzzer)

High-brightness LED (work tank)

High-brightness LED (AWF cover)

Wire loader (Max. 30kg)

Automatic grease lubrication



Removable table (α-C400iC)

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

Service & Support

Excellent Maintenance Services

FANUC service team delivers customer trust and confidence based on direction of service “Maximizing Uptime”, “Global Service” and “Lifetime maintenance”.

Service First

Conforming to the spirit of “Service First”, FANUC provides lifetime maintenance to its products for as long as they are used by customers, through more than 270 service locations supporting more than 100 countries and regions throughout the world.

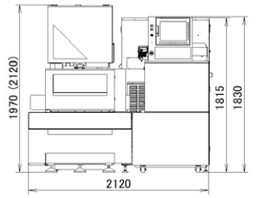
FANUC ACADEMY

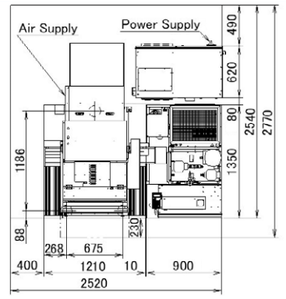
FANUC ACADEMY operates training programs on FANUC ROBOCUT which focus on practical operations and programming with cutting know how and maintenance.

Academy

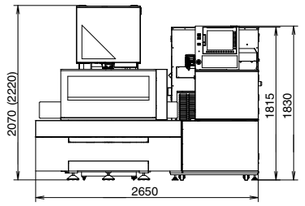
Floor Plan

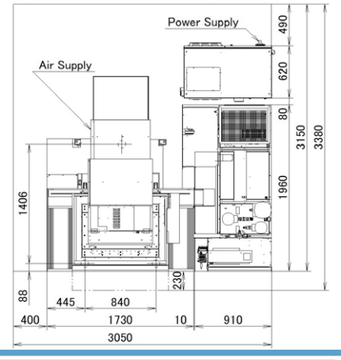
α-C400iC



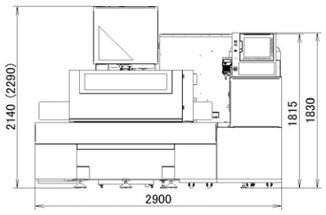


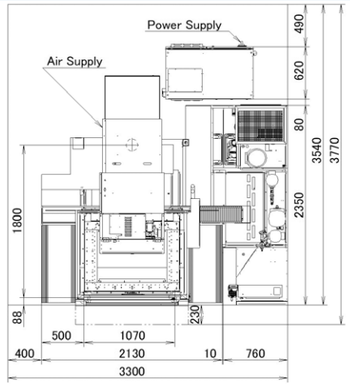
α-C600iC





α-C800iC





* 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 options.

Installation Requirement

Power supply	200VAC±10% 3-phase 50/60Hz ±1Hz 220VAC±10% 3-phase 60Hz ±1Hz Connection cable terminal size : 8-5 Power consumption : 13kVA	Environment	Ambient temperature : 15 to 30℃ *Recommend 20±1℃ for high precision cutting. Install under the oil mist free and dust free environment. Humidity : 75%RH or less
Air supply	Pressure : 0.5 to 0.7 MPa Flow rate : 160L/min or more *Regulator-side coupler mounting screw : Rc1/4	Grounding	400mm or more are recommended as concrete foundation ground where machine is located to endure its weight. Ground should be selected where no vibration or no impact effect. As vibration level, the maximum amplitude should be 2μm or less under frequency band from 10 to 20 Hz. 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.
Shield room	If discharge noise can interfere with surrounding radio, television and other sets, a shield room needs to be created		

Specifications

Model			α-C400*i*C	α-C600*i*C	α-C800*i*C
Maximum workpiece dimensions	without Automatic door	Z axis travel standard	730 x 630 x 250 mm	1050 x 820 x 300 mm	—
		Z axis travel option	—	1050 x 820 x 400 mm	—
	with Automatic door	Z axis travel standard	730 x 585 x 250 mm	1050 x 775 x 300 mm	1250 x 975 x 300 mm
		Z axis travel option	–	1050 x 775 x 400 mm	1250 x 975 x 500 mm
Maximum mass of workpiece			500 kg	1000 kg	3000 kg
XY axis table travel			400 x 300 mm	600 x 400 mm	800 x 600 mm
Z axis travel		standard	255 mm	310 mm	
		option	—	410 mm	510 mm
UV axis travel			±60 mm x ±60 mm	±100 mm x ±100 mm	
Maximum taper angle		standard	±30° /80 mm	±30° /150 mm	
		option	±45° /40 mm※1	±45° /70 mm※1	
Wire diameter		standard	φ0.10 to φ0.30 mm		
		option	φ0.05 to φ0.30 mm	—	
Maximum wire mass			16 kg		
Total mass (without dielectric liquid)			Approx. 2400 kg	Approx. 3250 kg	Approx. 5250 kg
Controller			**FANUC Series 31*i*-WB**		

※1 Retrofit available with 45 degrees taper kit

Product introduction video

FANUC CORPORATION

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