FANUC Wire EDM Machine

Alpha 0iE

100% Built in Japan
Features of the Alpha iE Series

- **Ai Pulse Control 2 Advanced Adaptive Control (patent pending)**
  The Fanuc iE series incorporates “Ai Pulse Control 2” a patented power discharge monitoring system that sorts and counts each discharge pulse then continually makes minute changes in cutting conditions to maximize the effective discharges within the gap. The Ai Pulse Control 2 incorporates a completely new lower head that isolates the power feed contact during finishing passes, reduces stray capacitance and results in superior finishes with less passes – especially in tall work pieces.
  ✓ Highly improved Step Cutting – Better accuracy and less lines in the work piece during thickness changes
  ✓ “Approach Control” – The witness marks at the entrance and exist point of the work piece dramatically reduced.
  ✓ Small Oval and Round Hole accuracy is improved – more accurate geometry and straighter walls are achieved with Ai Pulse Control 2.
  ✓ Improved Skim Cutting Finishes
  ✓ Corner Accuracy is improved due to the superior discharge & feed control
• **FANUC’s Patented “R” Technology Power Supply**
  Designed for poor flushing, Fanuc’s R power supply makes open gap cutting easier and more productive than ever. Any EDM can handle cutting flat work pieces; Fanuc’s new “R” power supply allows the operator to get the highest speed possible without wire breaks when open gap conditions are unavoidable. “R” technology is available for rough cutting (R1), rough and 1 skim (2R), and rough and 2 skim cuts (3R). With this new power supply you spend less time building fixtures and more time cutting work pieces.

![Image](image.png)

**Work material**: D2 Tool Steel  
**Thickness**: 2.0" - 0.40"  
**Wire diameter**: 0.010"  
**Accuracy**: 0.00020"

• **NEW AWF2 Function**
  Fanuc is world renowned for having the best AWF system on the market. The simplicity and reliability make unattended operation a true reality. Further upgraded for the iE series, the *new AWF2* offers the following enhancements:
  ✓ Submerged initial threading up to 200mm thick work pieces  
  ✓ Improved Ai Automatic Wire Repair in the cutting gap up to 150mm thick work pieces

_AWF monitor screen allows easy set-up of the following advanced functions:_
  ✓ AWF skip function  
  ✓ Retry skip function  
  ✓ AWF result screen  
  ✓ RE-machining function  
  ✓ Pecking retry function  
  ✓ Full-Retry function  
  ✓ Retry locations display
Wire breakage locations display

For a Video of the threader in operation click here: 
http://www.youtube.com/watch?v=jeDggDPeoUY

- Cut Monitor 2 with live remote part graphics (standard)
  All Fanuc Wire EDMs comes standard with the capability to remotely monitor the machine from any PC hooked to the company network. In fact up to 5 machines at once. Operators can now see graphically where the wire is in the cut remotely. With the new Cut Monitor2 capability, up to 311 machine status functions are continually monitored. This data is recorded and saved every 8 seconds during the entire cut for later use if needed. If a customer is requiring the ability to monitor more than 5 machines, there is an optional software package capable of monitoring up to 24 different FANUC EDMs of different vintages and models.
• **Low Operating Cost**
  Fanuc's new iE series machines ensure productivity and profitability are maintained.
  
  ✓ **Brass Wire Technology** - Fanuc designed the power supply to obtain the most out of their electronics thus achieving high speed cutting with standard brass wire. Fanuc EDMs do not need expensive oversized coated wire to achieve today’s high-speed cutting.
  
  ✓ **NEW “Wire Consumptions Savings Mode”** when activated will reduce the amount of wire usage by up to 34%. Useful in both rough and skim cutting.

![Graph showing wire speed vs wire thickness](image)

**Energy Saving Functions**

✓ The Fanuc 31iWA control now displays power consumption in real time. It also displays cumulative energy consumption.

✓ The machine will automatically reduce surplus electrical power during idle times which reduces overall energy usage. A graphic display shows the energy usage and consumption.

✓ Selecting which systems should be shut down during idle time is easily achieved through one screen on the control.

✓ **LED Work Lights** replace high energy consuming halogen lamps.

✓ In “Sleep Mode” energy usage by the machines is cut by more than ½.
• **Improved Ergonomics**  
The distance in front of the machine to the center of the table has been reduced which makes loading the machine and working inside the tank much easier for the operator.

• **Higher Accuracy**  
All Fanuc *iE* series machines incorporate “Nano Interpolation”. When processing work pieces our NC command resolution is an unprecedented .00000004” with Nano Interpolation. Fanuc *iE* series machines maintain a closer positioning accuracy to the programmed cutting path producing work piece tolerances higher than ever.

• **Positioning Capability**  
The *iE* series utilizes a new edge position pulse control that greatly improves pickup repeatability. The end result is pick-up positioning repeatability of up to .000027” depending on material and conditions.

• **Durability & Ease of Maintenance**  
  ✓ The *iE* series offers a standard polished stainless steel inside work tank. The highly polished surface reduces maintenance and allows for a brighter work environment when setting work pieces.  
  ✓ Rear Seal Plate removal and cleaning is a simple and quick operation and only needed when the operator notes the clear plate is getting dirty.  
  ✓ A wash down gun is also included to assist the operator in clean-up.

• **Simple Control Operation**  
  ✓ Programming and set up of the machine has never been easier. Editing programs, user graphics, and multi-window screens mean less time spent by the operator at the control.  
  ✓ The *iE* series graphics are three (3) times faster than our previous model
• **High Pressure Programmable Pump Technology**
  Fanuc's new *iE* series incorporates a higher discharge rate. The fully programmable flushing pumps provide better gap cleaning - even in the most demanding flushing situations.

• **Program Conversion Function**
  For those utilizing a Fanuc *iE* machine next to another brand of Wire EDM in the shop, Fanuc has added a program conversion function to allow the *iE* series to cut with a competitor's program. (note: not all functions may be supported)

• **Automation**
  As the world leader in CNC robotics, FANUC has incorporated the latest interface technology in the *iE* series to smoothly integrate most of the robots available on the market today. Regardless of what level of Automation you wish to achieve, Fanuc EDMs assure the highest unattended operation and provides the greatest return on investment.

• **Fully Integrated “Turn & Burn” Capability (optional)**
  Due to the power of the FANUC 31iWA control, the *iE* series is capable of fully integrating single and two axis rotary tables. These tables can be fully integrated into the control thus eliminating the need for a separate controller. With our large supplier base of rotary table manufacturers, we can “Turn” your problems into profitable solutions.
Additional Features of the FANUC 0iE-Med Series

- Fanuc high speed digital / AC power supply
- Fanuc series 31i-WA 64 bit CNC control
- Fanuc serial/digital AC servo motors
- Five controllable axes (X, Y, U, V, Z)
- 30 degree taper cutting capability
- NC Command Resolution of 0.0000004"
- Absolute position detection system
- Wire tension servo controlled via 2 servo motors
- Independent column mounted U and V axis slides
- Automatic wire feed system (10 sec. spark to spark)
- Anti-Crash protection (X, Y, U, V, Z)
- CNC operator panel
- 15" Color LCD – Touch Screen
- Programmable “Z” axis
- AI function – automatic setting of cutting conditions
- Handy controller (Hand held pendant)
- Quick conversational programming
- Automatic water level control in work tank servo controlled
- Operator guidance screens for operation, alarms, maintenance and parts
- RS232C input/output port for file transferring
- Ethernet port
- 2 USB Ports
- PCMCIA slot
- Part program storage capacity 4 Megabytes
- Automatic power recovery
- Automatic restart
- Wire center path calculation G41/42
- Coordinate system rotation
- Reverse copy (symmetry) M96/97
- Automatic corner rounding
- Low air pressure alarm
- Work coordinate system (G54-G59)
- Scaling
- Retrace
- Rotational copy
- Programmable flushing
- Mirror image X and Y axes independently
- Edge Finding / centering, G codes and Guidance Menus
- Decimal point input
- Inch / Metric switchable – G20/G21
- One Set of .010” High Precision die guides
- Submersible vertical wire alignment gauge
- Wash down hose with nozzle
- Chiller unit for dielectric fluid (Inverter controlled to +/- 0.1 deg C)
- Fanuc filtration unit
  The Fanuc system consists of two-canister style, 3-micron paper filters. The filters sit vertically on top of the clean water tank. The resin is now contained in a 1 cu. ft. bottle that is easily changed out by quick disconnects
- Manuals (1each): operator’s, maintenance, parts, AWF, cutting technology, safety precautions
- Wire breakage repair (AWR)
- AWF skip function
- Retry skip function
- AWF monitor screen
- AWF result screen
- RE-machining function
- Pecking retry function
- Retry locations display
- Full-Retry function
- Wire breakage locations display
- Alarm guidance
- AWF hole search function
- One (1) eleven pound spool wire .010” brass wire
Technical Data

- Main processor.......................................................... (Qty. 1) 64 bit
- Aux processors ............................................................. (Qty. 4) 32 bit
- Control method...................................................... Servo-closed loop
- Controlled axes ......................................................... X, Y, U, V, Z
  Plus optional rotary axis
- Least input increment ........................................... 0.000004"
- Least command increment ....................................... 0.00000004"
- Interpolation .......................................................... Linear, Circular
- Maximum programmable dimension ................................ ±999.99999 in.
- Position command.................................................. Coordinate Systems
  Relative, absolute and machine values
- Display unit.......................................................... 15" color liquid crystal display
- Position display ..................................................... Five axes at a time (X, Y, U, V, Z)
  Six axes at a time by option
- Part program storage and editing................................. 4 MB (standard)
- Input / output interface ........................................... RS232-C, Ethernet interface,
  PCMCIA-ATA style flash card, 2 USB Ports
- Scaling ........................................................................ 0 to 99.9999 times
- Figure rotation .......................................................... ± 360.00000 degrees
- Mirror image ............................................................ Independent X and Y axes
- Tape code .............................................................. Auto. Switching between ISO and EIA
- Feed rate ....................................................................... cutting 0.000004-2 in./min.
  Manual 4,8,12 in./min.
- Rapid traverse ......................................................... 1 ~ 50"/ min.
- Wire diameter compensation .................................... 0 - ± 9.99999 in.
- Automatic coordinate system skewing calculation

A list of M & G Codes utilized by the Fanuc Control is available upon request
Machine Tool Features

- Floor space ................................................................. 91.7" x 99.6"
- Machine weight .............................................................. 4,000 lbs.
- Maximum cutting speed***
  - .012" brass wire guides 2.4 in. thick tool steel .................. 31 square in./hour
  - 0.012" Coated wire 2.4" thick D2 tool steel ...................... 33.5 square in./hour
- Internal Worktank Size (X x Y x Z) .................................. 30.5" x 23.6" x 9.8"
- Maximum submerged cutting depth .................................. 9.84"
- Maximum work piece weight ............................................ 1,100 lbs
- Travel
  - X Axis ................................................................. 14.6"
  - Y Axis ................................................................. 10.6"
  - Z Axis ................................................................. 10.2"
  - UV axes travel ......................................................... ± 2.362"
  - Rapid traverse ......................................................... 1 ~ 50
  - Work piece thickness @ taper Angle .............................. ± 12 @ 10 in
    Manual threading (jet nozzle removed) ............................ ± 30 @ 3.26 in
    * Requires optional Diamond guides
      ± 45 @ 1.6 in
- Positioning accuracy (X, Y) ............................................ ± 0.0001
- Repeatability (X, Y) ..................................................... ± 0.00050
- Axes drive motors ...................................................... AC Servo Motors
  Direct coupled to ball screw
- Wire feed system
  - Wire feed rate ......................................................... 0 ~ 590 IPM
  - Wire tension ........................................................... 200 ~ 2,500 g
  - Maximum wire spool weight ........................................ 35 lbs
  - Wire diameter (min. to max.) ...................................... 0.004 to 0.012"
- Wire guide – upper & lower guide .................................. Round diamond
  Die guide
- Dielectric fluid system
  - Tank capacity .......................................................... 145gal
  - Chiller unit ............................................................ Standard
  - Dielectric fluid ....................................................... Deionized water
  - Resin bottle (one plus a spare) .................................... 1 cu. ft
  - Filters (2 each) ........................................................ Cartridge
  - Filtering precision ..................................................... 3 Micron
  - Dielectric fluid resistivity control ............................... NC Controlled
- Cutting conditions
  - Automatic selection of 9 choices for 1 Cut ....................... Standard
  - Automatic selection of 9 choices for multiple cut ............. Standard
  - Automatic selection of 3 choices for micro finish cut ......... Standard
- Programming methods
  - G-Code programming .................................................. Standard
  - Built-in easy conversational ....................................... Standard
  - Off-line system via RS232 or Ethernet interface ............... Standard
PC FAPT CUT specifications:

- IBM compatible
- CPU i486 DX4 or higher (math coprocessor required)
- RAM memory
  - Windows 98, NT 4.0, ME and 2000 – 64 MB
  - Windows XP, Windows 7 – 128 MB
- CD-Rom drive
- Display 1024 x 768 or higher resolution with 16 colors or more. (SVGA or XGA) (14" or larger)
- HDD-100 MB minimum storage requirement
- Mouse and keyboard
- Parallel printer port or USB port
- Operating system Windows 98, NT, 2000, ME and XP, Windows 7
- One Ethernet port
- 3D Video accelerator card – for rendering function
- Serial card (minimum one COM port) – for RS-232C file transmission