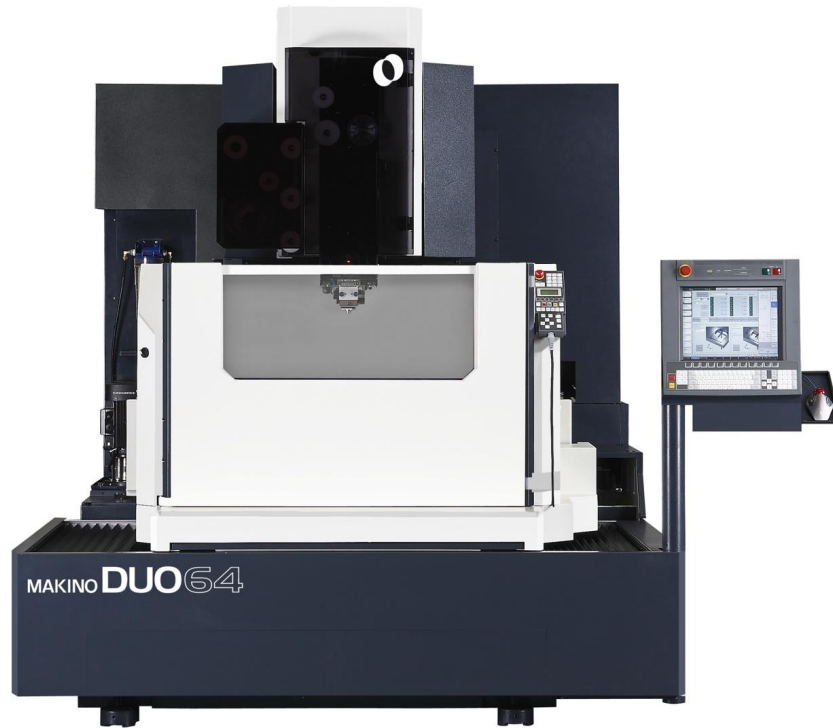


Makino DUO64

EDM WIRE MACHINE

Specifications & Installation Information



For Specific questions regarding your Installation or requirements,
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Makino *DU064* Wire EDM Machine

MACHINE SPECIFICATIONS		METRIC	ENGLISH
Travels	X, Y & Z Axis U & V Axis	650 x 400 x 420 mm ±101 mm	25.6 ö x 15.74 ö x 16.5ö ±3.97ö
Maximum Taper Angle		±15° (±45° with optional öCö Guides)	
Workpiece Size Inside of Worktank		1070 x 855 x 411 (320) mm	42" x 33.6" x 16.2ö (12.6ö)
Table Size		910 x 660 mm	35.8ö x 26ö
Max. load on table		1200 kg	2645 lbs
Distance- floor to table top		1000 mm	39.37ö
Ball Screw Diameter	X,Y	32 mm Ø	1.259ö Ø
	UVZ	25 mm Ø	.984ö Ø
	Class	5	5
Jog & Rapid feed Axis	X, Y, Z	50, 150, 600, 2,000 mm/min	1.96, 5.9; 23.6, 78.7 ipm
	U, V Axis	50, 150, 600, 1000 mm/min	1.96, 5.9, 23.6, 39.37 ipm
Servo feed		0.01-50 mm/min	0.00039 ~ 1.96 ipm
Positioning Resolution		.1 µm	0.000004ö
Feedback X, Y, U, V, Z		.1 µm Rotary Encoders	0.000004ö Rotary Encoders
Feedback X, Y		.05 µm Linear Glass Scales	0.000002ö Linear Glass Scales
Servo System			PWM Digital AC Servos

MACHINING ACCURACY & PERFORMANCE

Static	Positioning (full stroke)	±.0015 mm	±0.000059ö
	Repeatability	±.0015 mm	±0.000059ö
Dynamic	Shape precision	±.005 mm	±0.000190ö
	Roundness TIR	.005 mm	0.000190ö
Recommended Environment		20°C ± 1°	68°F ± 2°
Best Finish in Steel Plate		0.2 µm Ry	8 µinch Ra
Tool Steel, up to 3 inches thick			
Maximum Cutting Speed		>320 mm ² /min	>30 in ² /hr
(Using 0.3mm coated wire, SKD11 steel plate, 50mm thick, with high speed generator booster option)			

AUTOMATIC WIRE FEED & GUIDE SYSTEM

Wire Threading System	Dual Water Jet with Annealer	
Normal Threading Time	10 seconds/30mm thickness, 0.008ö Ø wire	
Recommended wire	Clean Hard Brass Wire, should be good in Straightness, Free from Bends	
Minimum Start Hole Diameter	.5 mm Ø Hole	0.020ö Ø Hole
Standard Spool Size	16 kg	35 lbs
Optional Wire Spool Size	20 kg	44 lbs
Wire Feedrate (Consumption Rate)	0.50 ö 360 mm/min	0.02 ~ 14.17 ips
Programmable Wire tension	2~30 N	1.475-22.127 lb/f

DIELECTRIC SYSTEM

Dielectric Reservoir Capacity	990 liters	261.5 gallons
Work tank	N/A	N/A
Filtering precision	6µm	0.00023ö
Number of Filters (Quick Disconnect)		4
Automatic Water Supply Unit		Optional
Digital Flushing Control	Independent Pumps for Upper & Lower Heads	
Conductivity		1 ~ 200 µs/cm
Temperature controller	Standard (synchronized with machine temperature)	
Dielectric Chiller		Standard
Cooling Capacity (60 Hz)	5.6 kW	7.5 hp (19125 BTU/hr)

MGW – S6 CNC POWER SUPPLY

Controlled Axes	5 axes: X, Y, U, V, Z
Optional	1 (Up to 6)
Simultaneous Controlled Axes	4 axes: X, Y, U, V
Part Program Storage Length	3100 m / 10,170 ft , (about 1.2 Mb)
Operation Panel : Display	15 inch color TFT Touch Screen
Keyboard	Flat QWERTY Keyboard
Graphic Display	Automatic Scale, Rotation, Zoom, Position Verification
s-Manual and e-Learning System	On-board electronic machine training and manuals
Maximum Machining Current	30 AMPS
Power Stabilizing Circuit	Standard
Anti-Electrolysis öLLö Circuit	Standard
Power Unit Cooling	Forced Air Cooling, Heat Exchanger
Filtration	None Required, Sealed Cabinet

ESTIMATING/MANAGEMENT FUNCTIONS

Dynamic Graphic Display	Process Management History
Machining Time & Cost Estimation	Disk Directory Management
Path Length Estimation	User Creation Screen
Run Hours	Help Window
Machining Time & Status History	Key Input Playback
I/O Interface	

SET-UP FUNCTIONS

128 Work Coordinates	Cylinder Center Measurement
Workpiece Edge Positioning	Work Parallelism Measurement
Hole Centering	Groove Width Centering
Wire Vertical Alignment	Plate Width Centering
Corner Edge Positioning	Work Coordinate Preset
Auto Measurement & Machining	Optional Program Stop
Mirror Image	Program Stop
XY Axes Exchange	End surface, Hole Center, Vertical
Measurement Touch AWT	Dry Run
Machine Lock	Reference Point, Workpiece Zero Point, Latest AWT Point,
One-Touch Return	Single Block

OPERATION SUPPORT FUNCTIONS

Scheduling Function	Automatic Wire Break Recovery
Approach Function	Auto Condition Reduction At Wire Break
Non-Contact Point Search	AWT Skip
AWT Retry	Water Timer
Automatic Power Cut-Off	Automatic Power Failure Recovery
Automatic Wire Threading	Process Skip and Additional Machining
Automatic Wire Cut	Reference Hole Retry

SAFETY AND MAINTENANCE

Overtravel	Soft Limit + Hard Limit
Work Limit	One-touch System
Stored Stroke Limit	Regular Check Screen
Maintenance Screen	Diagnostic Screen
Emergency Stop	

AUTOMATION SUPPORT SOFTWARE USED WHEN INSTALLED IN MULTI-MACHINE CELL

Parameter Output by Machine No.	Machining Status Record Output
Machining Condition Output	Data Back-Up
Machining Time Output	Initializing Data on Each Screen

INSTALLATION SPECIFICATIONS

Machine Dimensions W x D x H	2200 x 3140 x 2450 mm	86.6 öx 123.6 öx 96.5ö
Required Floor Space	3520 x 4180 mm	138.6 x 164.6ö
Machine weight	6000 kg.	13,227 lbs
Ambient temperature	10 ~35° C ± 1°	50 ~ 95°F ±2°
Optimum Temperature	20° C ± 1°	68°F ± 2°

Do not expose the machine to direct sunlight. Make sure that air conditioning vents are not blowing hot or cold air directly at the machine.

Shipping We recommend Air Ride Transportation. Machines are shipped FOB Port of Entry in two containers.

Electrical 200 VAC, The DUO43 requires 18 KVA input power with a ground of 10 ohms or less.
Example: $\frac{KVA \times 1000}{1.73 \times Voltage} = Amperage \times 125\% = Service\ Required$

Air 0.6 ó 1.0MPa @ 100L/min or more / 90 - 145psi. @ 3.3 CFM

Water Ordinary tap water can be piped directly into the dielectric reservoir

Environment Choose an area free of dust and vibration. An isolated foundation may be necessary if excessive vibration is present. The machine should be located in an area free of high volumes of dust, away from polishing or grinding machines.

Best results are achieved when stable temperatures and humidity are maintained.

Vibration0.7 m/s² {0.07 G} or less

Relative humidity75% or less (no condensation)

Specifications may change without prior notice to incorporate improvements resulting from ongoing R&D programs.

Cover machine photo is equipped with optional features.

LOW MAINTENANCE REQUIREMENTS

Over the years we have continually developed technologies designed to minimize the amount of maintenance and operator intervention required.

	TIME	Interval	Monthly[1]
1. Automatic Wire Threader	3 minutes	Once a week	12.0
2. Guide Cleaning	5 minutes	Once a month	5.0
3. Rollers:	10 minutes	Once a month	10.0
4. Energizer Plates (2):	5 minutes	80 machining hours	50.0
5. Filtration System	5 minutes	500 machining hours	13.0 [2]
Main filters			
AWT filter	5 minutes	Every 6 months	1.0
Air Filter	5 minutes	Every 6 months	1.0
Conductivity Probe	5 minutes	Every 2 months	2.5
DI resin	5 minutes	Every 2 months	2.5
6. General Cleaning	10 minutes	Once a week	40.0 [3]
7. Machine Lubrication	15 minutes	2000 machining hours	4.0
		Total Monthly	2 hours 21 minutes

[1] A month has 504 hours available (based on operating 6 days x 20 hours x 4.2 weeks per average month)

[2] Based on general Wire EDMing of tool steels. Filter life will fluctuate depending on material and type of machining.

[3] It is recommended that the main door seal (DUO-Series) and sliding *Seal Plates* be kept clean and free from a build-up of debris.