About CHMER

Established in 1975, CHMER is the largest EDM manufacturer in Taiwan, exporting over 55 countries. Product lines include Die Sinking EDMs, Wire Cut EDMs, Small Hole Drilling EDMs, High Speed Milling Machines, and Laser Machines. A comprehensive technical support completes our services.

RQ SERIES

Gantry Type Linear Drive Wire Cut EDM

◎Unprecedented rigid gantry structure.
◎High speed, high precision linear motor system.
◎15% cutting speed improvement with new i8+ power supply.
◎Fast and less parts AWT system.

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WRQ000Ev01

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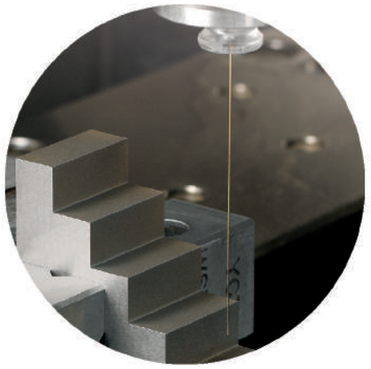
Features

Unprecedented rigid gantry structure shows unparalleled rigidity and stability. Combined with UX1 made-in-house linear motors, excellent AWT, and new i8+ power supply, the RQ series delivers high precision and high performance by hardware as well as by software. Connecting with you at any time, the RQ series is your top choice.

New Automatic Wire Threading (AWT) System

The most adequate design possibly is the fastest wire threading system in the world with less parts, 2/3~1/2 less than the Japanese or Swiss design, reducing the maintenance cost and faulty rate.



Optimized Gantry Structure

With the aid of FEM analysis, the optimized gantry structure, adopting high rigid casting iron, achieves high strength, high endurance, and high machining stability.

Patented Linear Motor

Equipped with made-in-house linear motors which have high response, vibration free, no backlash, long life, and no maintenance features, enhance the machining precision, efficiency, and reduce the energy consumption.

Interference Free Lower Arm Design

Unprecedented interference free design on the lower arm, connecting the work tank, avoids the possibility of water leakage due to the interference and friction and keeps the machining precision.

Energy-saving Inverter Chiller

Active temperature detection, smart frequency conversion, fast cooling speed, accurate water temperature control in ±0.3°C, stable and high-precision machining, 45% lower power consumption compared with other fixed frequency chillers.

New double-circulation system and new three-filter device greatly reduce the cost of consumables and improve competitiveness of production.

New i8+ Power Supply

With built-in voltage stabilizer which enables the machining stability, the new i8+ power supply improves 15% cutting speed and saves 20% energy, compared with previous power supply.

Advantages of Linear Motor

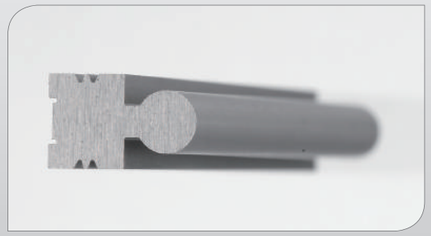
RQ series is equipped with CHMER UX1 linear motors with low power consumption provides high thrust and ensures the stability and accuracy of every movement. No friction, no backlash, no energy change loss, vibration free and high response. The lifespan is substantially increased by CHMER unique design.

Reduction of the tolerance on shape accuracy
(Especially at the intersection of straight line to curve)

Machining condition：

Brass wire：0.20mm/BS
Workpiece：SKD11
Thickness：50mm　Number of cuts：3

《Cutting profile》



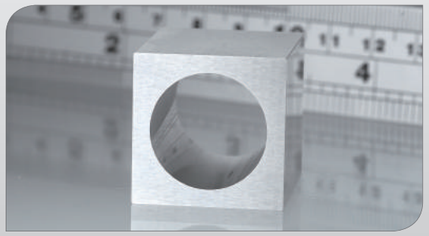
	Linear Motor		Ballscrew	
	Section A	Section B	Section A	Section B
Upper	5.999	3.999	5.999	3.998
Middle	6.000	3.998	5.998	3.995
Bottom	6.000	4.000	6.000	3.999
Tolerance	-0.001	-0.002	-0.002	-0.005

Unit:mm

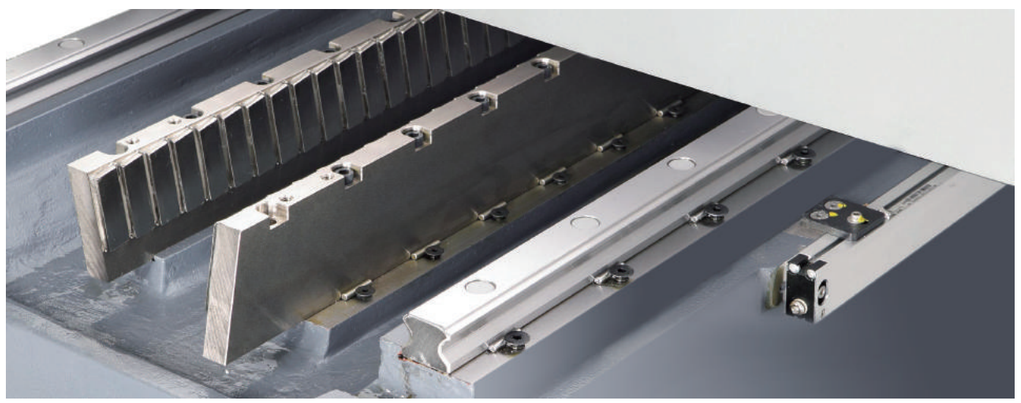
Enhancement of surface roughness

Optional AC-μ refining cutting circuit, combining with linear motors, enhances fine cutting speed and uniformness on 4 facets and achieves the fine cutting surface which is not possible reached by conventional ballscrew models.

Brass wire：0.20mm　Workpiece：SKD11
Thickness：25mm　Number of cuts：5
Surface roughness：Ra 0.23μm

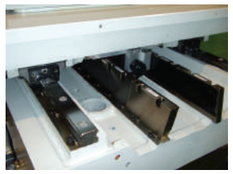


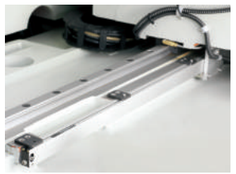
RQ Series (Linear motors)	Other models (Ballscrews)
5cuts　Ra0.23μm	5cuts　Ra0.28μm

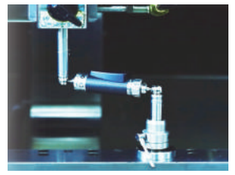


Linear Motor vs Ballscrew

Linear motor has to tactfully partner with linear scale (0.1μm resolution) to show its merit. Every RQ series wire cut EDM machine has passed rigorous quality control, including laser testing, and ball-bar testing, before delivering to the market.


◆Linear Motor


◆Linear Scale

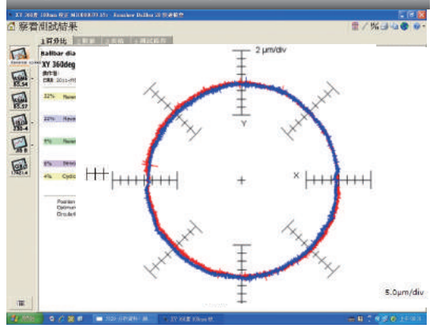

◆Ball-bar Testing

◆Laser Testing

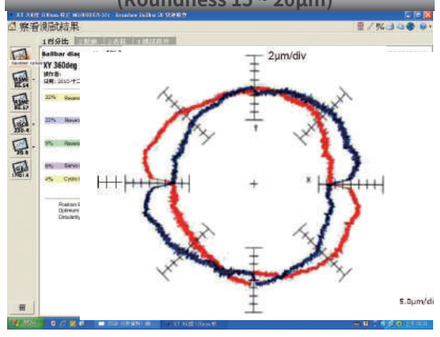
Ball-bar Testing

Use after 2 years

RQ Linear Models (Roundness 6 ~ 8μm)



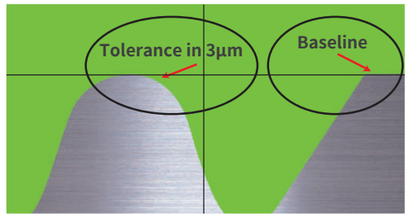
Conventional Ballscrew Models (Roundness 15 ~ 20μm)



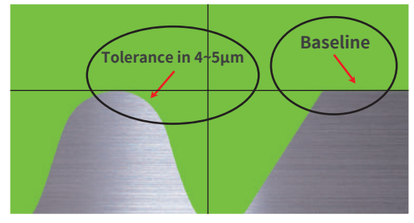
Linear motor demonstrates its outstanding performance on corner control

Machining Condition

Brass wire: 0.20mm　Thickness: 25mm　Workpiece: SKD11
Surface roughness: Ra 0.58μm　Number of cuts: 3　Acute angle: 30°　Radius: 0.20mm



Linear motor models
(Radius tolerance in 3μm)
Magnification: 120x

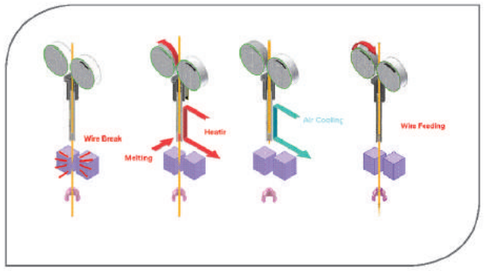


Conventional Ballscrew models
(Radius tolerance in 4~5μm)
Magnification: 120x

New Automatic Wire Threading (AWT) System

Day and Night Uninterrupted AWT System

The EC tension control technology delivers virtually 100% wire threading possibility. The most adequate design possibly is the fastest wire threading system in the world with less parts, 2/3~1/2 less than the Japanese or Swiss design, reducing the maintenance cost and faulty rate.

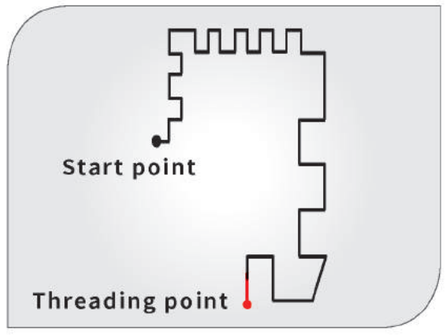


Reliable AWT System

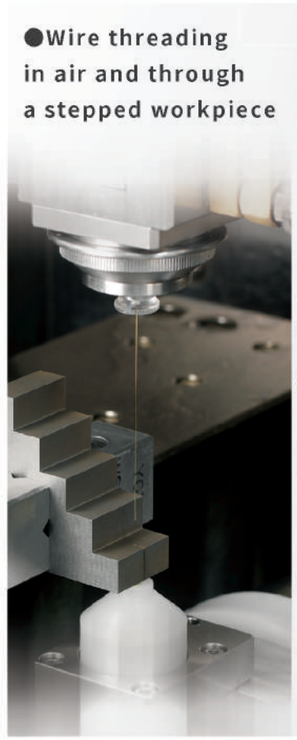
◎Concise mechanism enables easy maintenance and service.

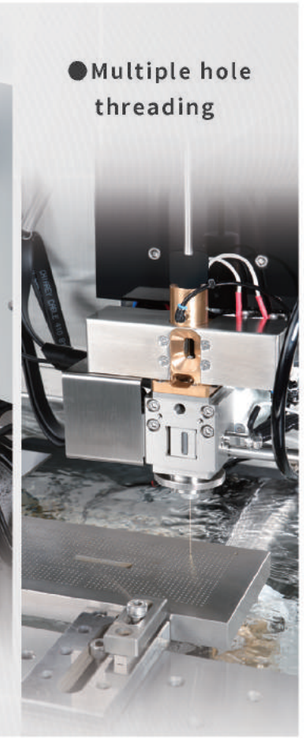
◎CHMER AWT system, delivering virtually 100% wire threading possibility, supports day and night unmanned operation.

◎With stable hardware, excellent electronic control circuits, and fast message processing, the AWT will automatically judge the priority of process procedures and accomplish the setting mission.



◎Automatic Wire Threading at breaking point: quickly recover the machining without any interruption.





New Servo Module AWT system

Intuitive parameter setting

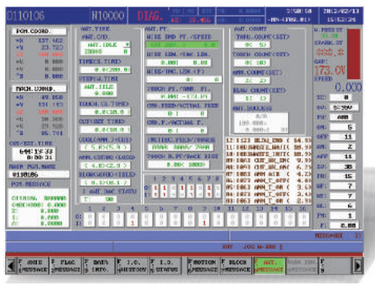
Parameters can be set according to different brass wires in the market.

100 sets of NC machining data

Record the latest 100 sets of NC programming data.
Automatically record start point, breaking point coordinates and work time.
Easy to find the machining information from the latest NC programming data.

3999 sets of hole machining data

Record 3999 sets of hole machining data.
User can check multiple hole machining conditions and restart the machining.



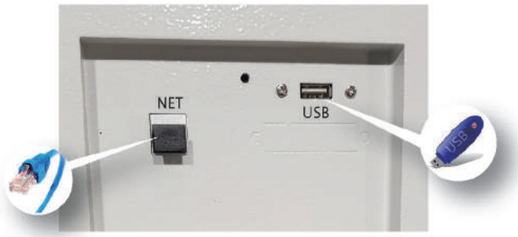
Monitoring screen

Record every motion and enhance the AWT stability and success rate.

Features of W5I controller

◎ Up to 7-axis control, supporting on-line measuring system, capable of equipping with Windows or Linus embedded system.
◎ All-in-one fan-less design, eliminating complicated wiring, reducing more than 65% of volume and weight and 50% of energy consumption.
◎ Supporting RS422/ RS485 data transfer, enhancing anti-interference ability, and increasing serial BPS speed.
◎ Dual core CPU, 1 GB RAM, 1GHz calculating speed, 1/3 calculating time compared to the previous one.
◎ 1G high storage space, supporting touch screen and hot swapping USB.
◎ Optional i-connected system can remotely monitor machine condition through personal hand held devices.

Notes:
1.Above mentioned W5I information is compared with W5F.
2.Embedded system adopts single core processor.
3.On-line measuring system is optional.



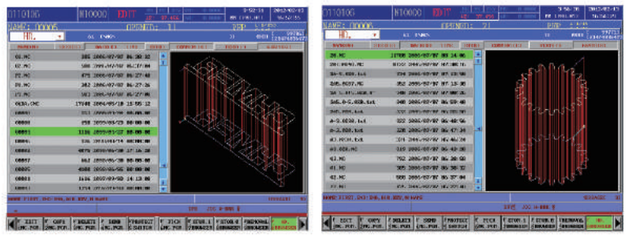
●USB and RS485 connector is convenient to upload and download files.

Remote Monitoring Era

◎Monitoring machine condition through web page

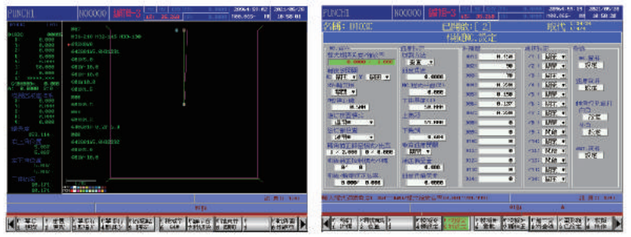
◎Real time monitoring machine operation through laptop computer or other smart portable devices.

Excellent Software Functions



User-Friendly File Management

Discharge Parameter Database

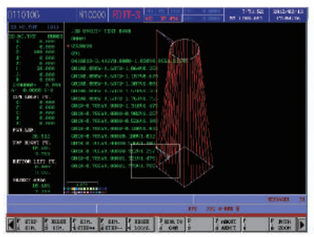


Internal corner cutting function

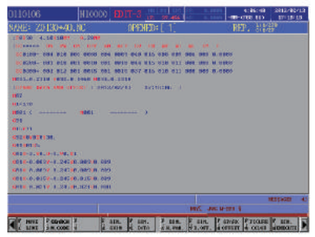
System Device Management + Parameter Optimization

Scrap Material holding function

Manual figure interface function



3D simulation figure + detailed route information

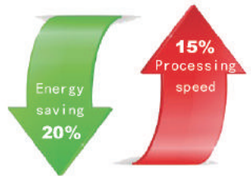


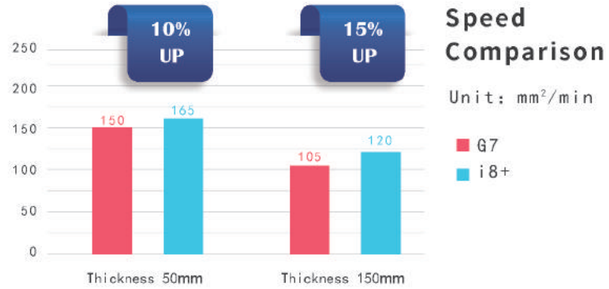
NC file log in

i8+ Power Supply System

The new i8+ power supply system increases the cutting speed by 15%, compared with the last generation, saves energy by 20%, and enhances machining stability by built-in intelligent voltage stabilizer.

◎ Machining speed increases by 15%
◎ Decrease of heat generated
◎ Wire breakage prevention function
◎ Increase of circuit reliability





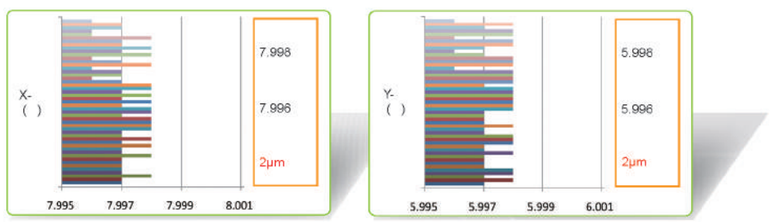
Speed Comparison

Unit: mm²/min

■ G7
■ i8+

HP-IVC Intelligent Stable Power Supply

The newly developed IVC high frequency switching power supply can stabilize and regulate voltage, keep constant temperature, and separate the workload and power supply to ensure the safety of the system.
With the latest technology, it can effectively convert unstable power input to stable power for internal use. In addition, it can intelligently supply higher power for high energy consumption machining and maintain stable power supply for high precision machining.

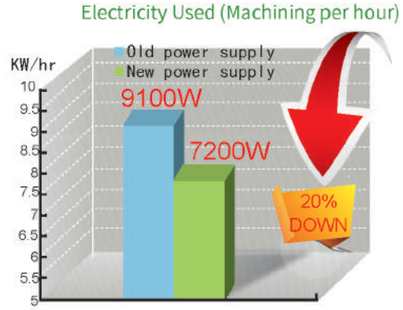


Continuous machining 50 pieces of punch
Machining size: 8x6mm T=30mm

Next Generation Renewable Energy Technology

The new i8+ power supply has the latest energy saving circuit which can convert the counter-electromotive force to power supply source for reuse. Apart from renewable energy, it eliminates the conventional heat sink circuit which generates heat and saves energy and reduces carbon emissions.

Electricity Used (Machining per hour)



Cutting Speed 160mm2/min

Special Industrial Processor and Discharge Control System

The embedded computer system reduces the system workload and increases the control of the system stability. The ASIC chip increases the stability of overall circuit operation and enhances the discharge performance. Real time feedback of discharge status stabilizes the cutting process and enhances the cutting speed and accuracy.

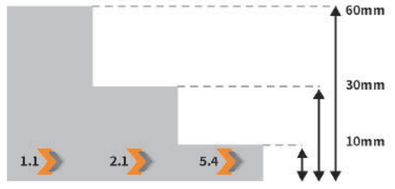
Intelligent Step Control (ISC) Power Supply(opt.)

Through monitoring discharge waves, ISC can provide precise discharge control for stepped workpiece and prevents wire breakage, alleviate wire marks, achieve high speed and stable machining, and results in high quality finished products.

Conditions : ▌Workpiece: SKD11 ▌diameter: Ø0.25mm

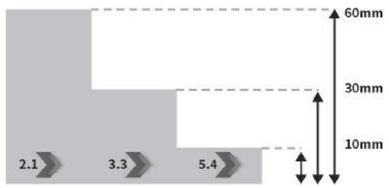
Speed Test UP ↑ +35%

Step function Off



Unit: mm/min

Step function On



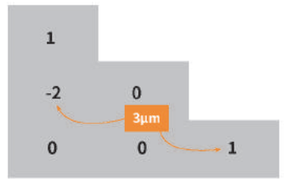
Unit: mm/min

Precision Test UP ↑ 6 μm

Step function Off

Unit: μm

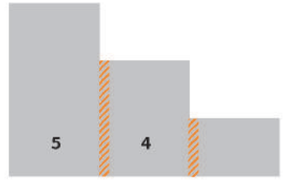
Step function On



Unit: μm

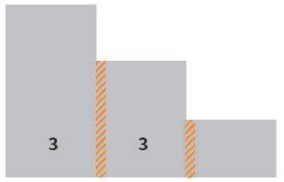
Concave Amount UP ↑ 2 μm

Step function Off



Unit: μm

Step function On



Unit: μm

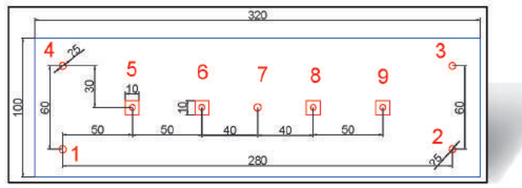
SAC-μ Device (Super Fine Cut Circuit) (Opt.)

Workpiece: SKD11 / Brass wire: 0.20mm / Thickness: 50mm							
Number of cuts		6	5	4	3	2	1
Surface roughness (μm)	Ra	0.12	0.20	0.28	0.62	2.0	2.4
	Ry	1.1	1.7	2.5	5.0	13.3	14.3

Workpiece	Tungsten steel	Brass wire	0.20 mm
Thickness	20.0mm	Number of cuts	8
Machining accuracy	3μm	Machining time	58 min
Surface roughness	Ra 0.09μm		

High Accuracy, High Repeated Machining

◎Workpiece Material: SKD11
◎Workpiece Thickness: 20.0mm
◎Brass wire: 0.20mm
◎Number of cuts: 3 (Rough cut: 1; Fine cut: 2)
◎Temperature: 23~24°C



Pitch Accuracy (mm)

	Coordinate		Tolerance	
NO	X	Y	X	Y
1	0.00	0.00	0.0000	0.0000
2	280.00	0.00	-0.0015	0.0000
3	280.00	60.00	-0.0028	-0.0015
4	0.00	60.00	0.0005	-0.0005
5	50.00	30.00	0.0005	-0.0003
6	100.00	30.00	-0.0008	0.0003
7	140.00	30.00	-0.0017	-0.0010
8	180.00	30.00	-0.0005	-0.0015
9	230.00	30.00	-0.0015	-0.0012
Minimum tolerance mm			0.0005	0.0003
Maximum tolerance mm			-0.0028	-0.0015

Shape Accuracy (mm)

		Tolerance	
NO	孔大小	X	Y
1	5.0000	0.0004	0.0003
2	5.0000	0.0006	0.0007
3	5.0000	0.0010	0.0009
4	5.0000	0.0006	0.0004
5	10.0000	0.0009	0.0010
6	10.0000	0.0008	0.0009
7	5.0000	0.0011	0.0007
8	10.0000	0.0007	0.0006
9	10.0000	0.0004	0.0005
Minimum tolerance mm		0.0004	0.0004
Maximum tolerance mm		0.0011	0.0010

Actual room temperature: 23.5±0.5°C Actual dielectric temperature: 23.5±0.5°C
Actual machine body temperature: 23.5±0.5°C

Samples

FPC Industry
High Accuracy Machining

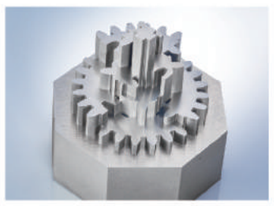
Workpiece Material: SKD11
Workpiece Thickness: 50 and 20mm
Brass wire: Φ0.25mm
Number of cuts: 3
Machining accuracy: 3μm
Surface roughness: Ra 0.58~0.63μm
Machining time: P: 40min D: 25min
*2 workpieces: sliding fit gap 3μm

Hand Tool Industry
Thin Wire 0.10mm Machining

Workpiece Material: SKD11
Workpiece Thickness: 3.0mm
Brass wire: Φ0.10mm
Number of cuts: 3
Machining accuracy: 10μm
Surface roughness: Ra 0.60~0.65μm
Machining time: 33min
Machining taper: -27.07°

Low Deformation
Fit Parts Machining

Workpiece Material: SKD11
Workpiece Thickness: 50mm
Brass wire: Φ0.25mm
Number of cuts: 3
Machining accuracy: 3μm
Surface roughness: Ra 0.68~0.70μm
Machining time: 5hr 33min
*2 workpieces: sliding fit gap 4μm

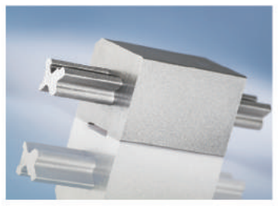


10-piece Module
High Accuracy Corner Fit Parts

Workpiece Material: SKD11
Workpiece Thickness: 30 and 20mm
Brass wire: Φ0.25mm
Number of cuts: 3
Machining accuracy: 3μm
Surface roughness: Ra 0.64μm
Machining time: 9hr 35min
*10 workpieces: sliding fit gap 4μm

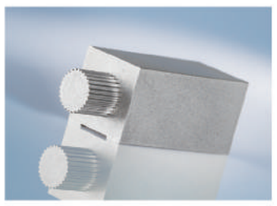
High Accuracy
Multi-direction Module Fit Machining

Workpiece Material: SKD11
Workpiece Thickness: 50 and 20mm
Brass wire: Φ0.25mm
Number of cuts: 3
Machining accuracy: 3μm
Surface roughness: Ra 0.64μm
Machining time: 13hr 52min
*Sliding fit gap 3μm



Continuous Stamping Die
High Accuracy Fit Machining

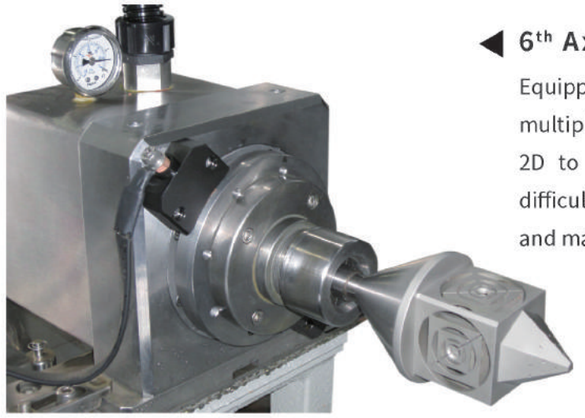
Workpiece Material: SKD11
Workpiece Thickness: 30 and 20mm
Brass wire: Φ0.20mm
Number of cuts: 3
Machining accuracy: 3μm
Surface roughness: Ra 0.63μm
Machining time: P: 15min D: 8min
*2 workpieces: sliding fit gap 3μm



Thin Wire 0.10mm Gear Machining
High Accuracy Fit Machining

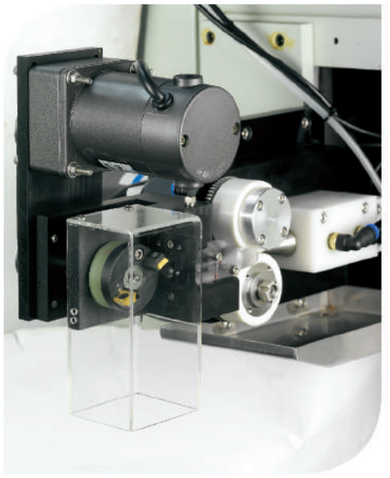
Workpiece Material: SKD11
Workpiece Thickness: 30 and 20mm
Brass wire: Φ0.10mm
Number of cuts: 4
Machining accuracy: 3μm
Surface roughness: Ra 0.60μm
Machining time: P: 66min D: 45min
*2 workpieces: sliding fit gap 3μm

Options



6th Axis Machining

Equipping with the 6th axis machining device allows multiple axis simultaneous machining, elevating from 2D to 3D machining, and achieves complex and difficult success rate, expanding machining capability and making the machine more value added.



Wire Chopper

Note: Not suitable for Φ0.10mm and thinner wires

Standard Specifications

Model		RQ3625L	RQ4025L	RQ5030L	RQ6040L
X, Y, Z Axis	mm	360x250x200	400x250x200	500x300x200	600x400x300
U, V Axis	mm	60x60	60x60	60x60	100x100
Maximum Size of Workpiece (WxDxH)	mm	650x450x200 (Flushing) 650x450x145 (Submerged)	750x450x200 (Flushing) 750x450x145 (Submerged)	850x500x200 (Flushing) 850x500x145 (Submerged)	910x600x300 (Flushing) 910x600x150 (Submerged)
Maximum Weight of Workpiece	mm	450	550	600	1000
XY Axis Feed Rate	mm/min	Max.1800	Max.1800	Max.1800	Max.1800
Drive System		XY Axes Linear Motor Drive/ UVZ Axes AC Servo Motor Drive			
Wire Diameter	mm	∅0.15~0.3(∅0.25) (0.1mm is optional)			
Maximum Wire Speed	mm/min	300	300	300	300
Wire Tension	gf	300~2500	300~2500	300~2500	300~2500
Maximum Taper Angle	mm	±14.5°/80 (Wide Angle Nozzle, DA+DB=15mm)			±21°/80 (Wide Angle Nozzle, DA+DB=15mm)
Machine Dimension (WxDxH)	mm	2400x2500x2250	2400x2500x2250	2650x2750x2060	2800x3050x2300
Net Weight	kg	2750	2800	3000	4000
Dielectric Filtration System					
Dielectric Capacity		930L	930L	930L	1250L
Filter		Paper	Paper	Paper	Paper
Ion Exchange Resin Filter		14L	14L	20L	20L
Water Quality Control		Auto	Auto	Auto	Auto
Water Temperature Control		Auto	Auto	Auto	Auto
Power Supply Unit					
Circuit		Power MosFET Transistor			
Maximum Output Current		25A			
Number of Current		10			
Number of Duration		50			
CNC Unit					
Input		Keyboard·USB ·LAN			
Screen		19" LCD			
Control System		32bit·1-CPU·X&Y Closed Loop			
Control Axis		X·Y·U·V·Z (5 Axis) 6th Axis optional			
Unit Setting		0.001mm			
Maximum Commend Value		±9999.999mm			
Interpolation		Linear/Circular			
Commend System		ABS/INC			
Machining Speed Control		Servo/ Const. Feed			
Scaling		0.001-9999.999			
Machining Condition Memory		1000-9999			
Total AC Power Input		3.Phase 220V±5%/11kVA			

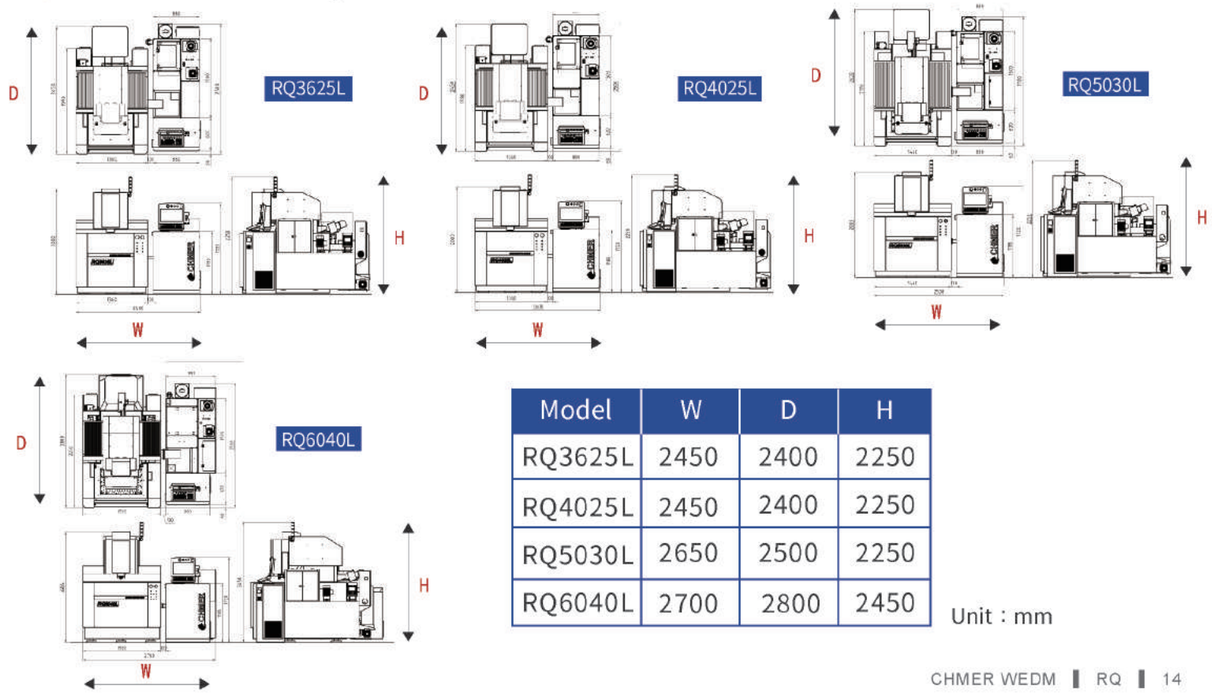
※Due to continuous improvements, the design and specifications are subject to change without prior notice.

Options Specification / Quantity

Standard ● Optional ○

Features & Item	Specification	Amount	RQ3625L	RQ4025L	RQ5030L	RQ6040L
Power Supply & Control System						
i8+ Power Supply		1 Set	●	●	●	●
AC/ DC Power		1 Set	●	●	●	●
Intelligent Step Cutting Control Power Supply		1 Set	○	○	○	○
SAC-μ Super Fine Cut Circuit		1 Set	○	○	○	○
Touch Screen	19"	1 Set	●	●	●	●
Interrupted Power Recovery		1 Set	●	●	●	●
USB Port		1 Set	●	●	●	●
Internet Data Transfer		1 Set	●	●	●	●
DXF File Transfer		1 Set	●	●	●	●
Remote Monitoring & Internet Connection		1 Set	○	○	○	○
Mechanism & Machining System						
UX1 Linear Motor Drive System	CHMER X&Y Axis	1 Set	●	●	●	●
Linear Scale	0.1μm Resolution (Absolute)	1 Set	●	●	●	●
AWT		1 Set	●	●	●	●
AWT Auxiliary Device		1 Set	○	○	○	○
0.1mm Wire Machining Device		1 Set	○	○	○	○
Manual Rise-and-Fall Tank Door		1 Set	●	●	●	●
Automatic Rise-and-Fall Tank Door		1 Set	○	○	○	○
High efficiency Water Circulation System		1 Set	●	●	●	●
Energy Saving Inverter Chiller	20000BTU	1 Set	●	●	●	●
Additional Functions						
Temperature Monitoring Device		1 Set	○	○	○	○
Digital Water Pressure Detection		1 Set	○	○	○	○
Brass Wire Weight Detection		1 Set	○	○	○	○
CE Conformity	EC Circuit + EMC Shield	1 Set	○	○	○	○
6th Axis Machining		1 Set	○	○	○	○
Jumbo Wire Feeder	3-30kg	1 Set	○	○	○	○
Auto Wire Chopper		1 Set	○	○	○	○
2 in 1 Transformer and AVR		1 Set	○	○	○	○
CHMER High Speed Zinc Coating Wire		1 Set	○	○	○	○

Machine Layout



Model	W	D	H
RQ3625L	2450	2400	2250
RQ4025L	2450	2400	2250
RQ5030L	2650	2500	2250
RQ6040L	2700	2800	2450

Unit : mm