

Automation of Die Sinker EDM

DX655C

Specifications

Machine Specifications			Specifications of Automatic Tool Change System		
Item	Unit	DX655C	Item	Unit	CRC50
X-axis Travel	mm	600	X1-axis Travel	mm	660
Y-axis Travel	mm	500	X2-axis Travel	mm	680
Z-axis Travel	mm	500	Z-axis Travel	mm	1065
Work Table Dimensions	mm	900 x 600	Angle of Rotating Axis	°	355°
Work Tank Dimensions (W x D x H)	mm	1500 x 1000 x 560	Max. Quantity for Electrode	pcs	48
Max. Workpiece Dimensions (W x D x H)	mm	1350 x 900 x 450	Max. Quantity for Workpiece	pcs	8
XYZ Driving System	X, Y, Z-axis Ballscrews		X1, X2, Z Driving System	X1, X2, Z-axis Ballscrews	
X, Y-axis Feed Rate	mm/min	Max.6000	Max. Weight of Electrode	kg	4
Z-axis Jump Speed	mm/min	Max.8000	Max. Weight of Workpiece	kg	50
Distance from Ram Platen to Work Table	mm	300 ~ 800	Max. Workpiece Dimensions	mm	Ø300 x 250L
Max. Weight of Electrode	kg	300	Cabinet Dimensions (W x D x H)	mm	1800 x 2400 x 2650
Max. Weight of Workpiece	kg	3000	Cabinet Weight	kg	2500
Machine Dimensions (W x D x H)	mm	1740 x 2400 x 2800			
Machine Weight	kg	3500			

Specifications of Power Supplier Unit		
Item	Unit	60N
Max. Working Current	A	60
Max. Input Power	KVA	5
Electrode Consumption Rate	%	0.2
Best Surface Finish	µm/Ra	0.1
Dimensions of Power Supply Unit	mm	700x1530x1850
Weight of Power Supply Unit	kg	180

Specifications of Dielectric Tank		
Item	Unit	DX655
Dielectric Fluid Capacity	L	1300
Filtration	method	Paper filter
Pump Power	HP	0.5x1 & 1x1
Weight	kg	290
Dimensions of Dielectric Tank	mm	1750x800x610 +1020x550x610

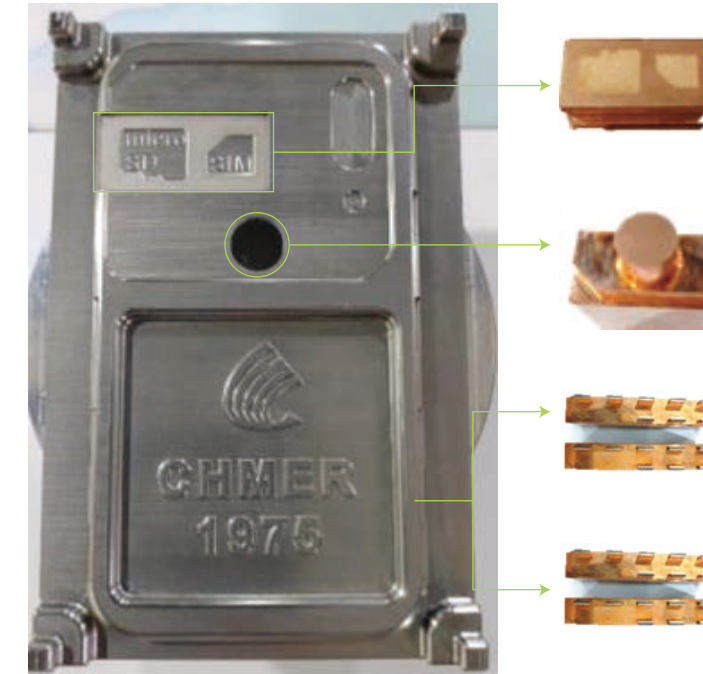
※Due to continuous improvements, the design and specifications are subject to change without prior notice



Machining Samples

【Smart Phone Middle Plate Mold】

Workpiece Material: NAK80 Electrode Material: Copper



【Middle Plate Mold】

Electrode undersize on one side: 0.05mm
 Processing Time: 95 min Surface Roughness: Ra0.45µm

【Mirror Finish】

Electrode undersize on one side: 0.05mm
 Processing Time: 75 min
 Surface Roughness: Ra0.10µm

【Clear Corners on 3 Holes】

Radius Consumption: 0.03mm Roughing Time: 30 min
 Surface Roughness: Ra0.80µm Fine Finishing Time: 8 min

【Clear Corners on 5 Holes】

Radius Consumption: 0.03mm Roughing Time: 40 min
 Surface Roughness: Ra0.80µm Fine Finishing Time: 11 min

【Smart Phone Middle Plate Mold】

Workpiece Material: NAK80
 Electrode Material: Copper



【Fine Finish】

Electrode Size: Ø50mm
 Processing Depth: 7.5mm
 Roughing Time: 40 min
 Fine Finishing Time: 4 hr 15 min
 Surface Roughness: Ra0.5~0.6µm

【Mirror Finish】

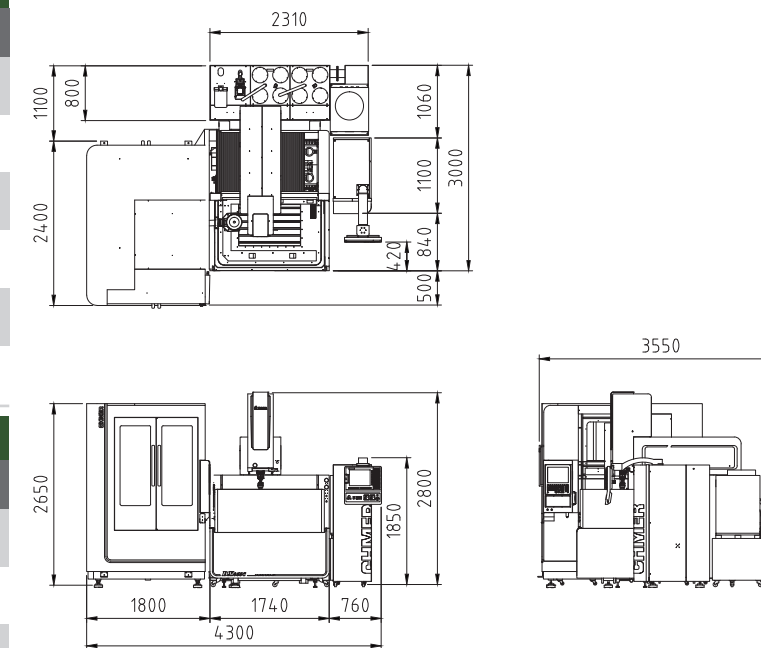
Electrode Size: Ø20mm
 Processing Depth: 0.3mm
 Processing Time: 3 hr 45 min
 Surface Roughness: Ra0.08~0.1µm

【Fine Finish】

Electrode Size: Ø50mm
 Processing Depth: 7.5mm
 Roughing Time: 15 min
 Fine Finishing Time: 2 hr 12 min
 Surface Roughness: Ra1.20~1.30µm



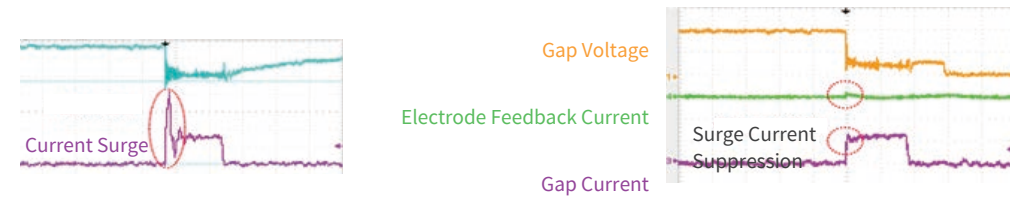
Installation Dimensions



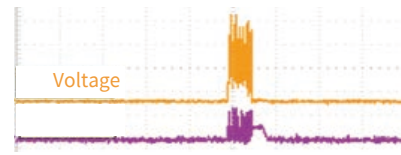
FEATURES

01 The 3rd Generation of Electrical Discharge Circuit, EDM 3.0

- ▲ PDG3 module and FPGA design enhance the electrical discharge quality.
- ▲ New fine finish processing circuit reduces the capacitor effect, diminishes the re-openings, and increases the machining efficiency with small current.
- ▲ Low electrode wear circuit, DLB, reduces the wear of small electrode at small current.
- ▲ Discharge feedback, CDGAP, reduces electromagnetic interference and judges abnormal arcing during discharging.
- ▲ Discharge power supply, AVR, improves the stability of discharge voltage and ensures the machining quality.
- ▲ Resistor-less circuit, NR, provides energy saving and various machining modes.
- ▲ CDEXT circuit enhances fine finish efficiency, improves roughness and fine finish on super hard alloy.



Problem of high frequency fine finish current - re-openings



1.Modular Display

- ▲ 7 Modules
- ▲ "Man" (Manual), "Edit", "Auto", "Disp" (Display), "File", "Set", "S.C." (S Code) can switch directly on the screen to streamline the operation
- ▲ Simplifying S Codes
- ▲ All S codes are listed on one page to reduce the page switching and add convenience. The machining programs are transferable.
- ▲ Machining Speed Figures
- ▲ Records processing changes and provides program data for reference
- ▲ Operation by function-Easy and intuitive

2.Expert Programming

- ▲ Considering trimming amount by electrode, automatically generates processing programs
- ▲ Common processing modes: standard, clear corners, ridge/deep groove, injection gate/pouring point, mirror finish/polishing, cone tip, etc.
- ▲ Processing priority setting: low electrode wear or high processing speed
- ▲ Electrode protection setting: protects the delicate pattern at the end of the electrode to avoid damage due to high current
- ▲ Different processing programs for different trimming amounts with respect to different electrode sizes
- ▲ Automatically generates processing programs after inputting CAM processed file

3.Remote Monitoring

- ▲ After machine status is uploaded to the central control unit, the control unit can remotely start, stop, and switch executive programs on the machine. The central control unit can also send electrode compensation data to machine controller and realize the unmanned operation at machine side.

02 Optimized Structural Design

Meeting all-round processing requirements, the moving column structure with fixed work table design features high accuracy, and rigid construction, verified by 3D simulation and FEM (Finite Element Method), guarantees the machining accuracy.

03 Industry 4.0 Automatic Production

Meeting all-round processing requirements, the moving column structure with fixed work table design features high accuracy, and rigid construction, verified by 3D simulation and FEM (Finite Element Method), guarantees the machining accuracy.



04 Automatic Tool Change System (Optional and Customized)

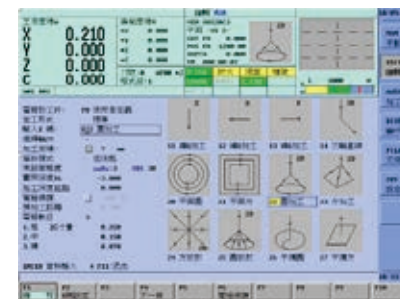
1. Upper level is electrode storage for max. 48 electrodes and lower level is workpiece storage for max. 8 workpieces.
2. Automatic operation after setting up
3. Object detection device for tools, workpieces, and fixtures
4. Changeable clamp design
5. Capable of serving two machines
6. High flexibility, connecting to any machines through I/O

Intelligent Discharge Expert System

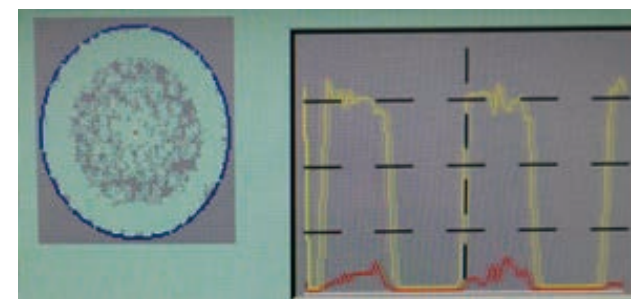
Equipped with simple and intuitive dialogue interface, the proprietary controller can generate a program of processing conditions by simply inputting machining options.



Selects corresponding materials of electrode and workpiece, processing modes, and processing area



Intelligent processing route code setting (E code), instead of NC codes, i.e. G, M codes

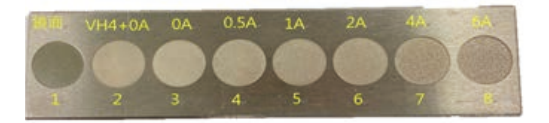


Real time recording of discharge efficiency and arcing rate

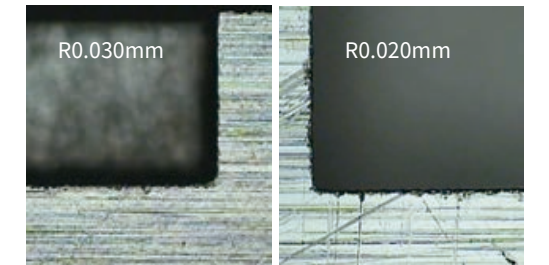
Machining Samples

CHMER Surface Finish Table

No.	Setting	Ra	Ry	Rz	VDI 3400
1	Mirror	0.09	1.1	0.7	2
2	VH4+0A	0.37	2.6	2.2	12
3	0A	0.60	4.6	3.5	15
4	0.5A	0.85	6.9	4.8	18
5	1A	1.16	7.9	5.9	21
6	2A	1.59	10.2	6.7	24
7	4A	2.74	15.7	10.7	29
8	6A	3.86	24.4	15	32

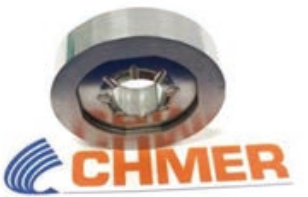


General Circuit Low Electrode Wear Circuit



Mirror Finish 1

- Workpiece Material: SKH9
- Electrode Material: Copper
- Processing Depth: 1.275mm
- Roughing Time: 14 min 20 sec
- Fine Finishing Time: 2 hr 37 min
- Surface Roughness: Ra0.14μm



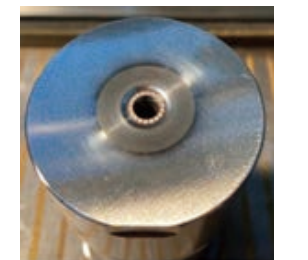
Mirror Finish 2

- Workpiece Material: S50C
- Electrode Material: Copper
- Electrode Size: 37 x 37 mm
- Processing Depth: 1.22mm
- Processing Time: 6 hr 13 min
- Fine Finishing Time: 2 hr 37 min
- Surface Roughness: Ra0.24μm



Tungsten Steel Mold

- Workpiece Material: Tungsten Steel
- Electrode Material: Copper
- Electrode undersize on one side: 0.05mm
- Processing Depth: 0.7mm
- Processing Time:



Semiconductor Assembly Mold

- Workpiece Material: ASP-23
- Electrode Material: Copper
- Electrode Size: 250 x 30 mm
- Processing Depth: 0.2mm
- Processing Time: 1 hr 39 min (Single Row)
- Surface Roughness: Ra1.8μm
- Surface Flatness: Within 0.005mm

