Seibu

SEIBU ELECTRIC & MACHINERY CO., LTD.

The Pioneer Spirit Lives On

Seibu made the world's first CNC wire Electrical Discharge Machine (EDM) in 1972.
With a fine and silky smooth motion, an electrode wire can cut metal as desired.
Our new, innovative technique for high-quality, high-precision cutting is based on the pride in our craftsmanship that has made those characteristics bywords in our company and representative of our products.
Seibu will continue to take that extra step in EDM manufacturing to provide our valued customers with innovations and quality arising from the combination of traditional technique and advanced technologies.

Skill 技

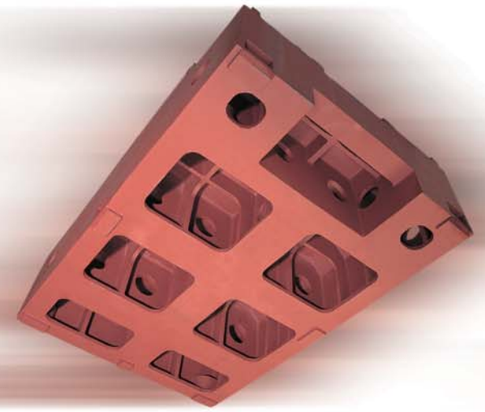
A traditional scraping technique called *"Kisage"* is used to make very smooth, high-precision finishes on metal surfaces which is disable to attain by machine.
With our high standards for quality, imperfections of even micron size are unacceptable. Our high standards for quality are proof that the work is repeated until perfection is attained.

Intelligence 知

The latest cutting-edge technology, "AI function", is used to achieve the best results. Our skill in combination with Seibu's user-friendly EDM M series is proof that man and machine can work well together.

Rigidity 剛

The machine base is an incredibly strong box-shaped structure that absorbs external vibrations and stabilizes the temperature.
It is cast of high-carbon Meehanite with thick walls and cross-ribs to assure incredible high rigidity, which offers long-term high precision.



1972 The history starts here...

1972
- First CNC wire EDM machine in the world developed, first system manufactured in Japan.

1973
- Sales of wire EDM systems began.

1974
- Automatic programming system developed.

1983
- Dry Annealing automatic wire feed system developed.

1987
- Ultra-precision wire EDM system developed.
- Start-hole drill developed. Fully-automatic wire EDM system developed.

1988
- Automatic wire feeding device developed for continuous operation.

1989
- Wire EDM system with pallet changer developed.

1990
- Seibu Electric's proprietary FMS system, EDM-DIO, developed.

1995
- World's fastest automatic wire EDM system developed.

1998
- Certified under ISO 9001

2000
- SC circuit power supply developed.

2002
- Machine-mountable start-hole drill developed.

Our Competitive Spirit Lives On

We are determined to be “The One” to provide complete and total satisfaction.
Improving precision, performance and operability of our products is not merely the goal or desire of the company but an absolute motivating factor and purpose.
Our never-ending quest into research for cutting-edge technology led to the development of the M-series of high-speed, high-precision wire Electrical Discharge Machines.

2003

M350S

Max. workpiece dimensions	: 600(W)×550(D)×220(H)mm
Max. workpiece weight	: 350kg
Axis travel range	: 350(X)×250(Y)×230(Z)mm

The M Series, another step into the future

M500S

Max. workpiece dimensions	: 800(W)×650(D)×300(H)mm
Max. workpiece weight	: 800kg
Axis travel range	: 500(X)×350(Y)×310(Z)mm

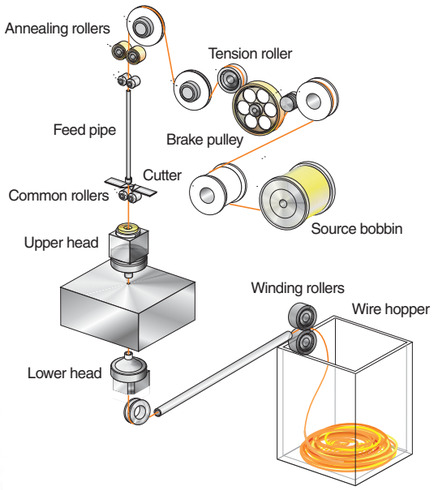
M750S

Max. workpiece dimensions	: 900(W)×700(D)×300(H)mm
Max. workpiece weight	: 1000kg
Axis travel range	: 750(X)×500(Y)×310(Z)mm

To meet the demands for higher productivity, we successfully targeted upgrading and enhancing the efficiency of our products.
We have consistently made innovations and improvements such as improved cutting efficiency and feeding speed to our products since we first developed our automatic wire-feeding device (AWF) in 1983 that uses dry annealing. We came up with the world's fastest AWF machine in 1995 and continue to set our sights high making us a leader in innovations and improvements to keep us in the lead.

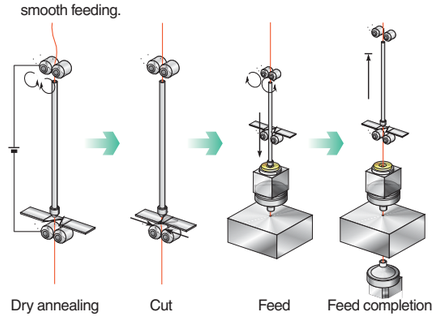
High-speed wire connecting and continuous cutting are coordinated to eliminate dead time. This is the key technology behind the M-series and ensures customer satisfaction.

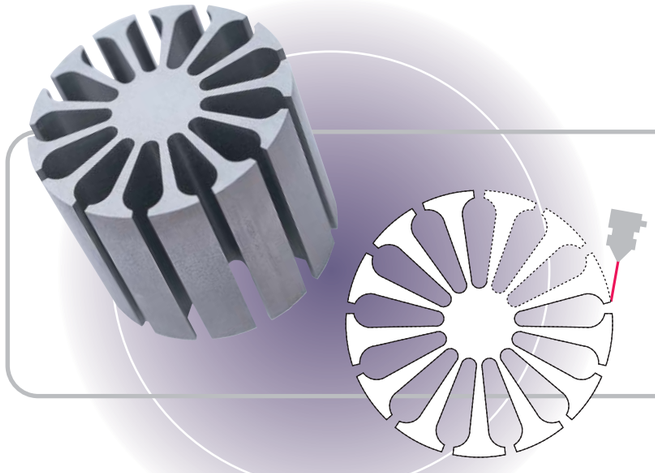
Finely Tuned, Total Coordination
for ideal non-stop operation



Automatic wire feeding (AWF)

An annealing current is repeatedly passed through the wire, and the wire is pulled while being heated to straighten it using our dry annealing method. This results in a straight wire and smooth feeding.



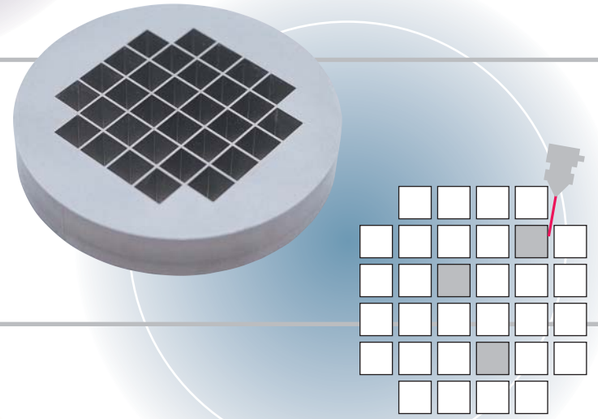


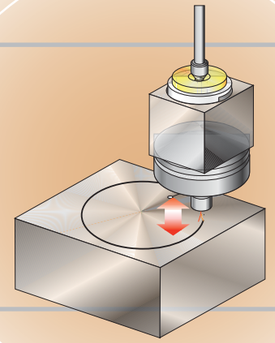
Feed at the Breakage Point
(patented in Japan, Europe, and the USA)

Broken wires during working are rewined at the position failured automatically and immediately, so the operation can continue without stopping. Because it does not return to the start hole, an automatic non-stop operation is assured for high efficiency. Even if the first attempt fails, the automatic retry function assures a performance that is close to 100%.

Skip Function

If wire feeding fails when cutting a series of shapes continuously, the system will remember the position and jump to the next shape in the series.
After all programmed cutting has been completed, the system will return to the unfinished section and finish the incomplete cuts without stopping the operation. This function increases the cutting efficiency.



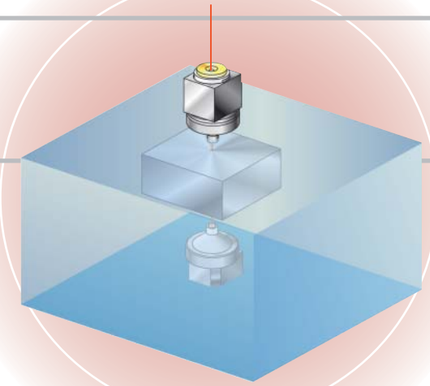


Friction Sensor

The friction sensor detects if any friction is applied to the wire and takes preventive action. The wire tip can be finely controlled so that a wire can be inserted into narrow slits or the start hole just as if you were threading a needle. This ensures stable and reliable feeding.

Submerged Wire Connection

Because of the dry annealing, the wire is kept straight. Therefore, the wires are connected accurately and reliably, even when submerged. No need to drain and refill the bath.



Total Harmony of Detail and Beauty In
for upgraded cutting precision

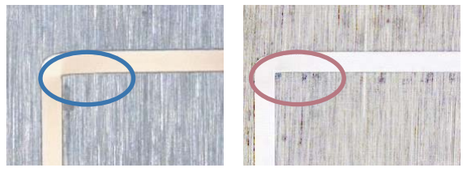
Our success in achieving ever-higher standards of precision through research is based upon very ambitious goals, which we strive to reach and transcend. Our pioneer spirit, attention to detail and standards of quality are exemplified in the traditional skill and rigidity of our machines that create smooth and fine finishes. Our world's first CNC wire electrical discharge machine created in 1972 has been the inspiration behind our endeavors and accomplishments.

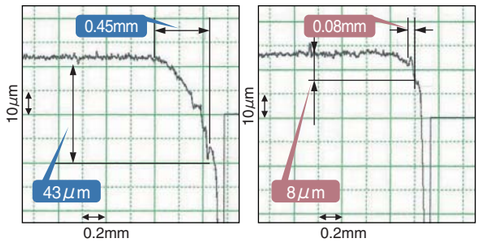
Our technique creates the best cutting results regardless of shape, thickness, or type of material.
This is the proof of the power and capability of the M-series that you can rely on.

Upgraded Corner Control

Wire slacking can be minimized to significantly enhance the precision of both the inner and outer corners.
(The following pictures show the cutting for the inner corner.)

Without corner control | Upgraded BD corner control





Note : The graph shows the results of the first cutting.

Surface Finish

The best surface finish can be obtained regardless of the workpiece material or shape. Using the M500S EDM for example, a surface of Ry 3.8 μm for SKD11 (JIS) is obtained by cutting twice. By adding optional device to the standard model, a surface roughness of Ry 0.6 μm (WC) and Ry 0.7 μm for SKD11 (JIS).

Ry0.7μm

Workpiece material :	SKD11 (JIS)
Wire diameter :	0.2 mm
Number of cuts :	7 times (SF supply)
Surface roughness :	0.7μmRy
Thickness :	30 mm
Cutting time :	90 min

Ry0.6μm

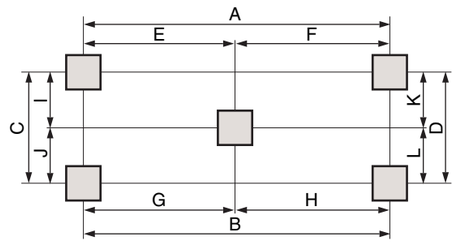
Workpiece material :	WC
Wire diameter :	0.2 mm
Number of cuts :	7 times (SF supply)
Surface roughness :	0.6 μmRy
Thickness :	15 mm
Cutting time :	60 min

Ry3.8μm

Workpiece material :	SKD11 (JIS)
Wire diameter :	0.2 mm
Number of cuts :	2 times
Surface roughness :	3.8 μmRy
Thickness :	50 mm
Cutting time :	270 min

Pitch Cutting

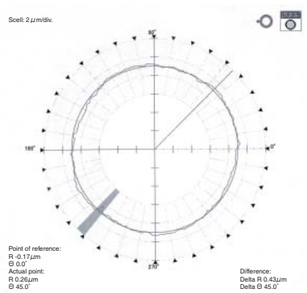
A pitch compensation function with a 2-mm pitch memory is provided. The compensation of a 5000-point pitch can be compensated. For extremely high positioning accuracy, an AC servomotor with a resolution of one million pulses is connected to each axis for smooth feeding and a high response. As a result, the pitch cutting accuracy is improved.



Example: Pitch Accuracy of the M350S EDM
(Workpiece thickness: 20 mm)

	Setting (mm)	Measured Value (mm)	Error (mm)
A	300	300.000	0.000
B	300	299.999	-0.001
C	200	199.999	-0.001
D	200	200.000	0.000
E	150	149.999	-0.001
F	150	150.001	0.001
G	150	149.999	-0.001
H	150	150.000	0.000
I	100	99.999	-0.001
J	100	100.000	0.000
K	100	100.001	0.001
L	100	99.999	-0.001
Maximum Error			**0.001**
Minimum Error			**-0.001**

Roundness



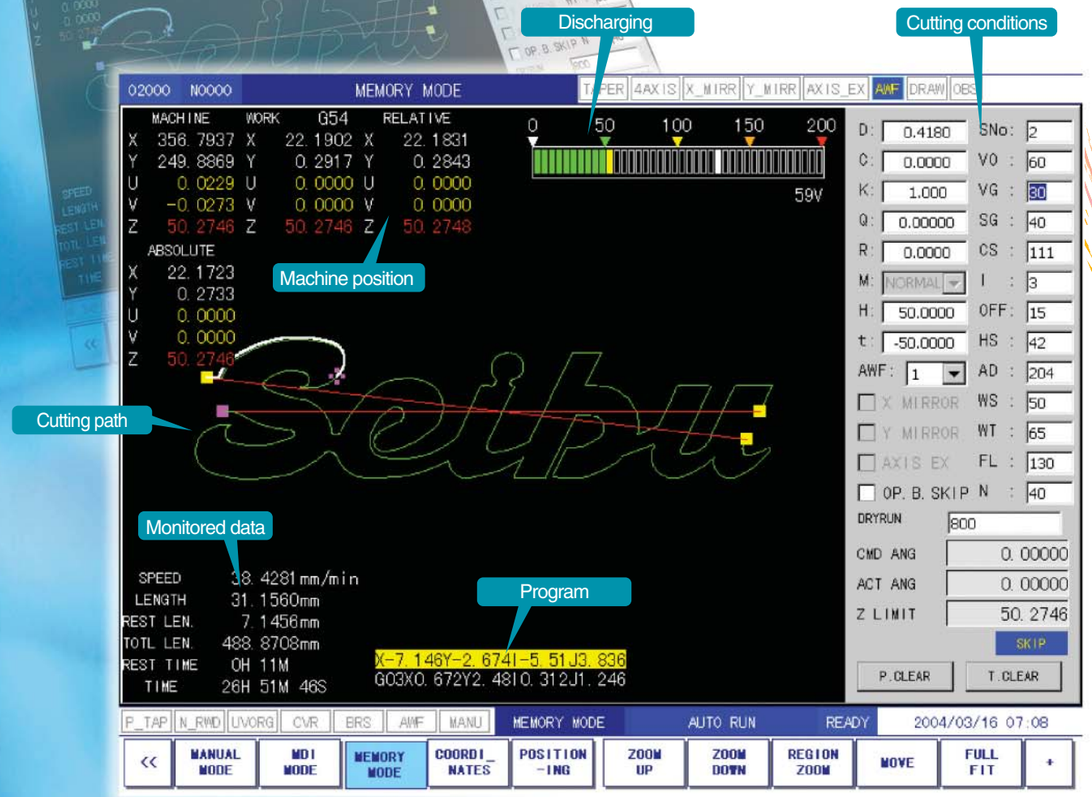
0.89μm

Workpiece material :	SKD11 (JIS)
Wire diameter :	0.2 mm
Number of cuts :	6 times
Workpiece Thickness :	20 mm
Cut diameter :	10 mm

For the improved operability that is essential for all machines, the design must be simple and easy to understand.
The operation panel has a 12.1-inch, color TFT-LCD touch panel and GUI for Windows. You can write and edit programs even while the cutting conditions and operation status are displayed so you can see all the crucial information at a glance.

Our products respond to user needs for cutting in specific environments.
This is the concept of the user-friendly M-series.

Total Supervision and Control
for improved operability

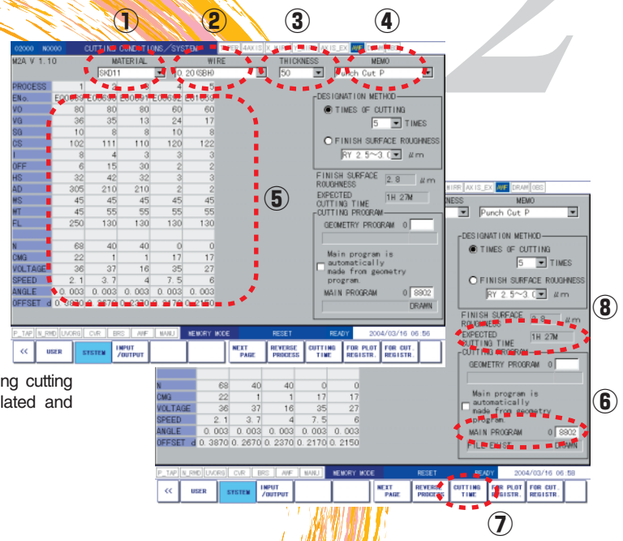


1

Menus

Simply touch a button on the touch-panel screen, and the selected window opens.

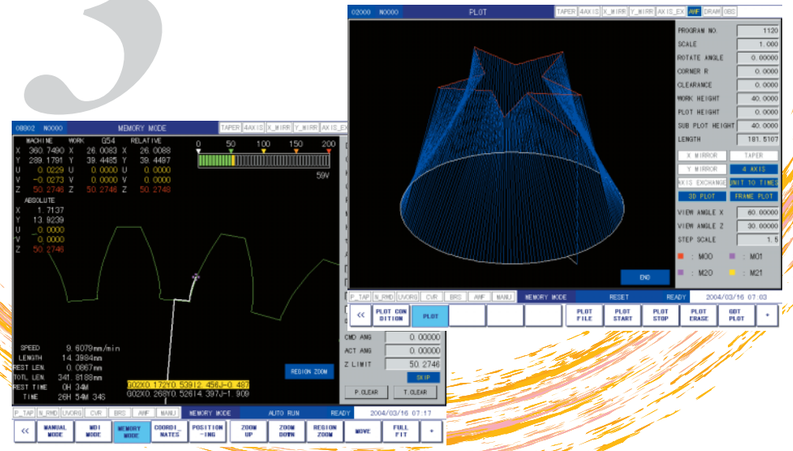
2



Cutting Conditions

- Selects the best/optimum cutting style.
  Depending on the four conditions, workpiece material (①), wire diameter (②), workpiece thickness (③), and cutting shape (④), the optimum cutting style is determined and displayed (⑤).
- Calculates the estimated cutting time.
  By simply selecting a program (⑥) and then selecting cutting time (⑦), the estimated cutting time (⑧) is calculated and displayed.

3

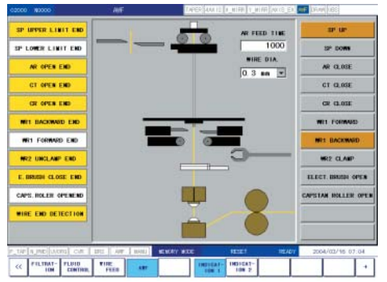


Visual Graphics of Cutting Program

- Graphic display by auto-scale
  You can zoom in or out on the image or move it by simply touching the screen.
- Drawing during cutting
  By using a background drawing, an image can be drawn during cutting to save time. The graphic image can be immediately transferred to the window where the actual cutting is being monitored.
- 3-D graphic display
  If cutting different shapes on the top and the bottom of a workpiece, the images for tapering or cutting can be viewed in three dimensions.
- Color-coded M-codes
  M-codes are color-coded by type, so you can visually check the program to avoid mistakes in programming.

Peripheral Devices Monitor

[Animated graphic display for AWF]

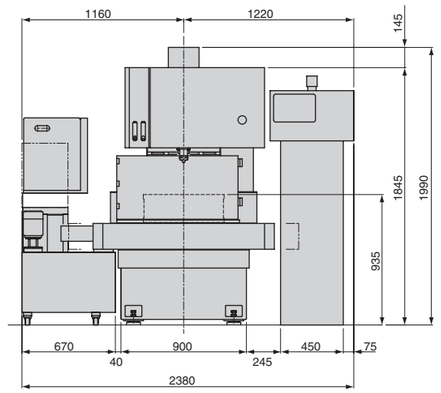


The status of each peripheral device can be seen in an animated graphic display, so you can easily check the actual status of the overall operation.

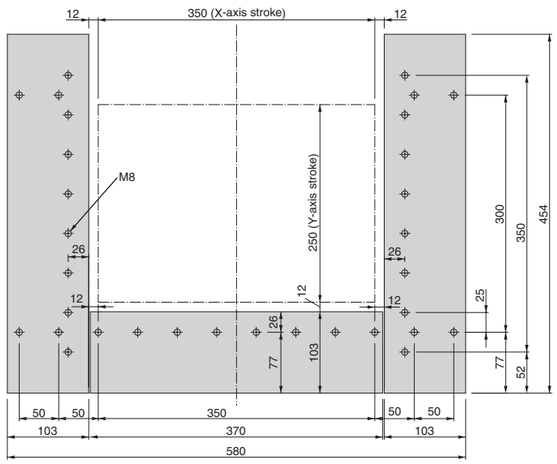
M350 Series

Submerged type : M350S
Flushing type : M350

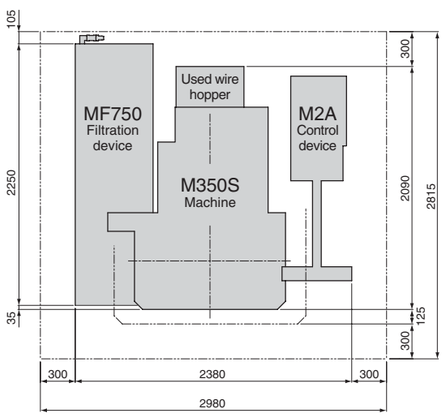
■ Dimension (mm)



■ Work Table (mm)



■ Layout (mm)



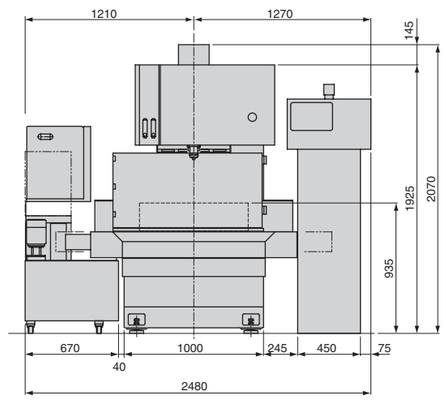
■ Specifications

Machine	Model	M350S (M350)
	Max. workpiece dimensions W×D×H	600×550×220 mm
	Max. workpiece weight	350 kg
	Axis travel range X×Y×Z	350×250×230 mm
	Wire diameter	0.1mm to 0.3mm dia. (0.2mm dia. is standard.)
	Automatic wire feeding device	Equipped as standard
	U-V axis travel U×V	±60×±60 mm
	Max. taper angle	±10°(220mm work thickness)(±15°/190mm option)
	Dimensions W×D×H	1,530×2,090×1,990 (1,340×2,090×1,990) mm
	Weight	2,500 kg
Filtration Device	Model	MF750 (MF350)
	Tank capacity	750 (410) L
	Filter element	4 internal-pressure paper filters, 340 dia.×300 (2 filters, 290 dia.×500) mm
	Deionizer	Ion-exchange resin 20 (5) L
Control Device	Model	M2A
	Input system	MDI, Memory card, Ethernet, RS232C, or 3.5 inch FDD (optional)
	Display	12.1 inch color TFT LCD (Touch panel)
	Axes controlled	5 axes (simultaneously 4 axes)
	Least input increment	0.001/0.0001 mm
	Least command increment	0.0001 mm
	Tape memory length	2,560 m max. (1,024 kB)
	Input power source	3-phase 200/220 V ±10%, 12 kVA, 50/60 Hz

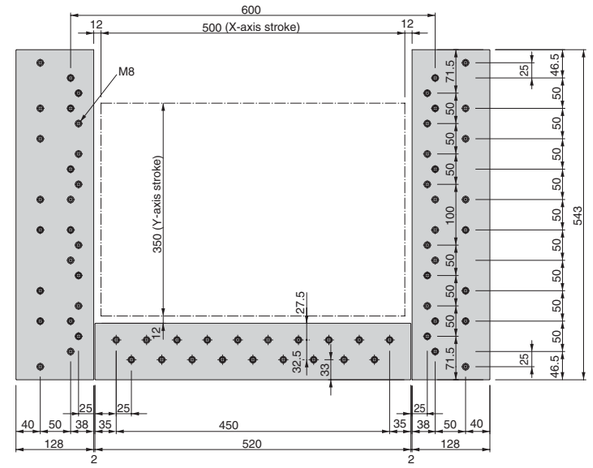
M500 Series

Submerged type : M500S
Flushing type : M500

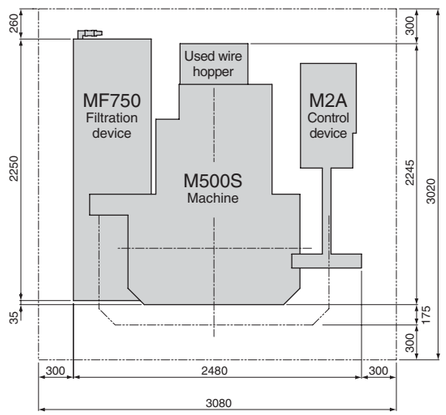
■ Dimension (mm)



■ Work Table (mm)



■ Layout (mm)

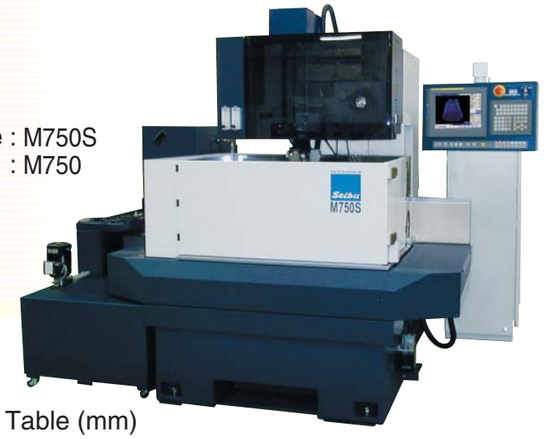


■ Specifications

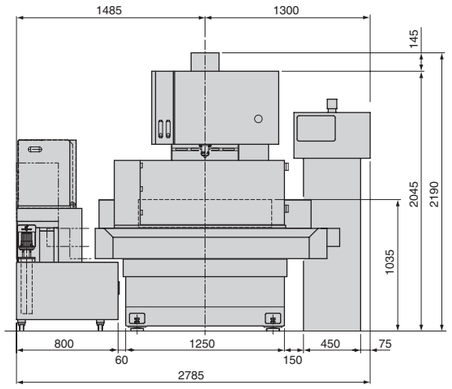
Machine	Model	M500S (M500)
	Max. workpiece dimensions W×D×H	800×650×300 mm
	Max. workpiece weight	800 kg
	Axis travel range X×Y×Z	500×350×310 mm
	Wire diameter	0.1 mm to 0.3 mm dia. (0.2 mm dia. is standard.)
	Automatic wire feeding device	Equipped as standard
	U-V axis travel U×V	±60×±60 mm
	Max. taper angle	±10°(300 mm work thickness)(±15°/190mm option)
	Dimensions W×D×H	1,810×2,245×2,070 (1,480×2,245×2,070) mm
	Weight	3,500 kg
Filtration Device	Model	MF750 (MF350)
	Tank capacity	750 (410) L
	Filter element	4 internal-pressure paper filters, 340 dia.×300 (2 filters, 290 dia.×500) mm
	Deionizer	Ion-exchange resin 20 (5) L
Control Device	Model	M2A
	Input system	MDI, Memory card, Ethernet, RS232C, or 3.5 inch FDD (optional)
	Display	12.1 inch color TFT LCD (Touch panel)
	Axes controlled	5 axes (simultaneously 4 axes)
	Least input increment	0.001/0.0001 mm
	Least command increment	0.0001 mm
	Tape memory length	2,560 m max. (1,024 kB)
	Input power source	3-phase 200/220 V ±10%, 12 kVA, 50/60 Hz

M750 Series

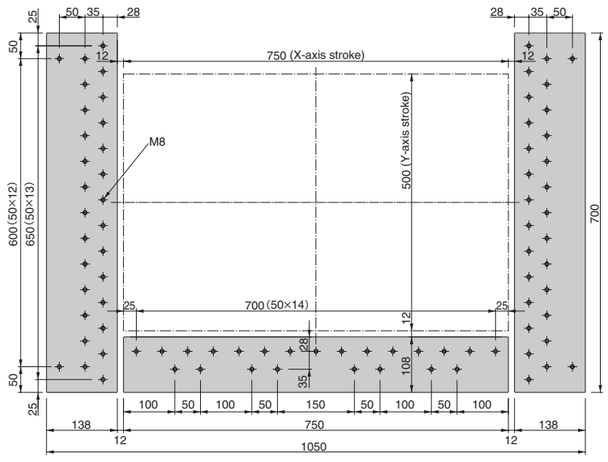
Submerged type : M750S
Flushing type : M750



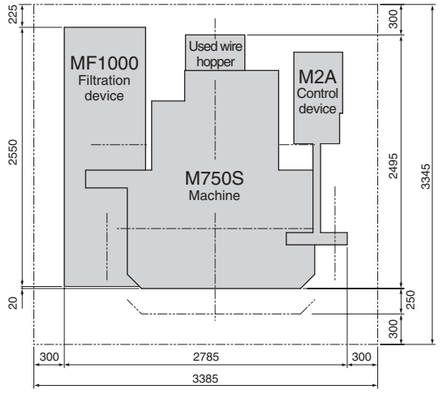
■ Dimension (mm)



■ Work Table (mm)



■ Layout (mm)



■ Specifications

Machine	Model	M750S (M750)
	Max. workpiece dimensions W×D×H	900×700×250*(300) mm
	Max. workpiece weight	1,000 kg
	Axis travel range X×Y×Z	750×500×310 mm
	Wire diameter	0.1 mm to 0.3 mm dia. (0.2 mm dia. is standard.)
	Automatic wire feeding device	Equipped as standard
	U-V axis travel U×V	±60×±60 mm
	Max. taper angle	±10°(300 mm work thickness)(±15°/190mm option)
	Dimensions W×D×H	2,255×2,495×2,190 (1,845×2,495×2,190) mm
	Weight	5,000 kg
Filtration Device	Model	MF1000 (MF350)
	Tank capacity	1,000 (410) L
	Filter element	4 internal-pressure paper filters, 340 dia.×300 (2 filters, 290 dia.×500) mm
	Deionizer	Ion-exchange resin 20 (5) L
Control Device	Model	M2A
	Input system	MDI, Memory card, Ethernet, RS232C, or 3.5 inch FDD (optional)
	Display	12.1 inch color TFT LCD (Touch panel)
	Axes controlled	5 axes (simultaneously 4 axes)
	Least input increment	0.001/0.0001 mm
	Least command increment	0.0001 mm
	Tape memory length	2,560 m max. (1,024 kB)
	Input power source	3-phase 200/220 V ±10%, 12 kVA, 50/60 Hz

*: Max. submerged cutting depth is 250mm. Flush cutting available for work 250 to 300mm high.

Option

Ana-ake Taro (Patent pending)

The Ana-Ake Taro is a start-hole drill that can be mounted on a machine in one second. The wiring, piping, and connections to the electrodes (1.0 dia. × 300 mm) are simplified. The positioning for the X, Y, and Z-axes to a work point on the workpiece can be made manually or from the touch panel.

Ana-ake Taro

Rust-proofing Unit for Iron and Similar Materials

This rust-proofing unit works well for materials subject to rust, such as S50C and NAK55. The Rust-proofing unit without pump uses predetermined conditions to automatically decide whether to ionize water for rust-proofing.

Rust-proofing Unit (with pump)

Options

*: Options are available for all models.

Options	M350S (M350)	M500S (M500)	M750S (M750)	Remarks
Super finishing power supply (SF supply)	*	*	*	
Power off unit	*	*	*	
External alarm output unit	*	*	*	External signals are sent at completion of work and at the occurrence of an alarm.
Integrated cutting hour meter	*	*	*	Displays the total cutting time
Wire diameter adjuster (AWF-3M model)	*	*	*	
Linear scale for X-Y axes	*	*	*	
Linear scale for U-V axes	*	*	*	
Automatic vertical square jig	*	*	*	
Ana-Ake Taro (SHM)	*	*	*	Simple type start hole cutting machine
Working fluid cooling device	*	*	*	4.29/4.32 kW, 50/60 Hz
Wide-angle taper nozzle	*	*	*	With a set of upper and lower nozzles
Wire feeder	*	*	*	Wire feeder with a 20-kg roll. (One roll of wire is provided.)
Air compressor	*	*	*	
Tension meter (analog)	*	*	*	Range: 0N to 9.8N
Tension meter (digital)	*	*	*	Range: 2N to 20N
FDD unit (model N1064)	*	*	*	Note: The RS232C communications are disabled.
Rust-proofing unit (with pump)	*	*	*	Note: The rust-proofing unit makes iron or similar materials rustproof. It is not effective with castings and nonferrous metals including copper, aluminum, and carbide.
Rust-proofing unit (without pump)				

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Be sure to read the "Instruction Manuals" and "Safety Precaution Manual" before use to ensure proper and safe use.

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