



SEIBU ELECTRIC & MACHINERY Co., LTD.

Precision Machine Division 3-3-1 Eki-higashi, Koga, Fukuoka 811-3193
TEL + 81-92-941-1509 FAX + 81-92-941-1521

Head Office & Factory	3-3-1 Eki-higashi, Koga, Fukuoka 811-3193 TEL + 81-92-941-1500 FAX + 81-92-941-1511
Tokyo Branch	Tachibana Kameido Bldg 3F, 2-26-11 Kameido, Koto-ku, Tokyo 136-0071 TEL + 81-3-5628-0011 FAX + 81-3-5628-0022
Osaka Branch	Mainichi Shimbun Bldg 5F, 3-4-5 Umeda, Kita-ku, Osaka 530-0001 TEL + 81-6-4796-6711 FAX + 81-6-4796-6707
Nagoya Sales Office	2-3101 Hara, Tenpaku-ku, Nagoya 468-0015 TEL + 81-52-800-5051 FAX + 81-52-800-5030
Kyushu Sales Office	3-3-1 Eki-higashi, Koga, Fukuoka 811-3193 TEL + 81-92-941-1510 FAX + 81-92-941-1522
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Tokyo Service Center	1-13-2 Tajiri, Ichikawa, Chiba 272-0014 TEL + 81-47-378-7261 FAX + 81-47-378-7266
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For more details of our products, please use our inquiry form in the website below.
www.seibudenki.co.jp (for the North America market visit www.kgk.com)



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

- Reference values in this catalog are based on in-house testing only.
- All specifications are subject to change without notice.
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Agency



4134-0
Issue: August 2017



High-precision wire EDM

MB series

SEIBU CNC Wire EDM since 1972

Installed by

Seibu Machine Advanced Realize Technology **Smart NC**



Seibu

High Precision Wire EDM Technology

“Committed to Peak Performance”

MB series

MB Series: Pursuing the Highest Level of Precision Machining
Seibu's MB Series wire EDMs are designed to achieve high levels of precision accuracy.

Every step in the MB Series manufacturing process assures repeatability, fine surface finishes and tight tolerances.



Seibu Machine
Advanced
Realize
Technology **Smart NC**

All models are equipped with newly developed NC device [Smart NC].



M35B/MM35B



M50B/MM50B



M75B/MM75B



UltraMM50B

3types, 7models



UltraMMB

UltraMM50B

- Pitch cutting accuracy $\pm 1\mu\text{m}$
- Wire diameter $\phi 0.05$ to 0.3mm



MMB_{series}

MM35B·MM50B·MM75B

- Pitch cutting accuracy $\pm 2\mu\text{m}$
- Wire diameter $\phi 0.07$ to 0.3mm



MB_{series}

M35B·M50B·M75B

- Pitch cutting accuracy $\pm 3\mu\text{m}$
- Wire diameter $\phi 0.1$ to 0.3mm

Combining traditional manufacturing practices
techniques with the latest technology

Seibu created the world's first CNC electrical discharge machine (EDM) in 1972.
Since then, we have steadily improved the productivity and precision of our expanding line of EDM systems.
Adding new functions, Seibu is constantly researching and improve the user's productivity.
Seibu's newly developed oil type Ultra Precision Wire EDM "M25LP" brings EDM manufacturing to a wider
range of products. M25LP is ideal for the manufacturing of metal lead frames, carbide machining,
small electronic and medical components.

The secret behind our unsurpassed precision is repeated "Kisage" hand scraping, while attaining a level of
flatness that cannot be reached with machining.

Tradition with technology : the MB series brings you perfect cutting precision.



Our traditional "Kisage" scraping technique



Scraping



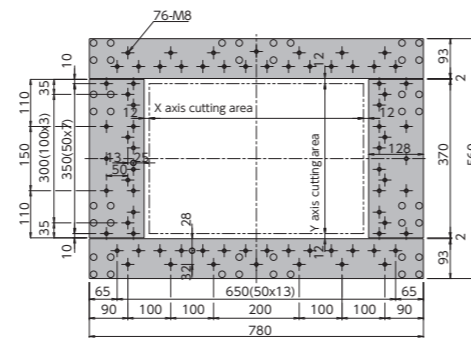
Scraped surface

Ultra MM50B

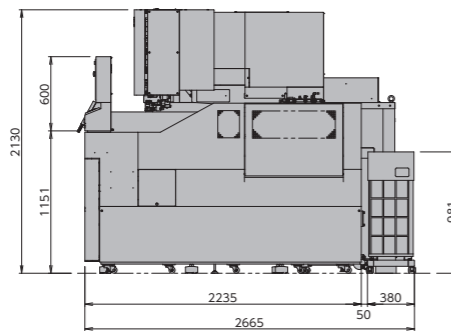
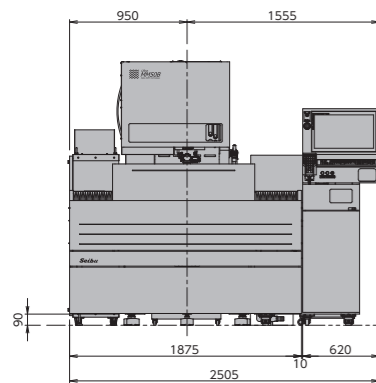
Specifications/
Dimension



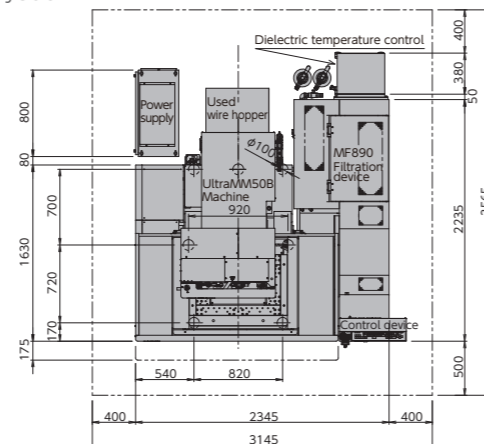
■ Work Table



■ Dimension



■ Layout



■ Standard Specifications

Model	Ultra MM50B
Max. workpiece dimensions W×D×H	800×650×200 (250※1) mm
Max. workpiece weight	800 kg
Axis travel range X×Y×Z	500×350×260 mm
Automatic wire feeding device	AWF-4 Equipped as standard
U-V axis travel U×V	±60×±60mm
Max. taper angle	±10°/work thickness250mm※2
Dimensions W×D×H	1,875×1,930×2,050 mm
Weight	3,400 kg

※1 For workpiece of 200 to 250mm, non submerged machining is used.
※2 ±45° /40mm = option.

■ Wire diameter (φ0.2mm is standard.)

Model	Ultra MMB
φ0.05mm~0.3mm	

■ Control device

Model	SmartNC
Input system	MDI, Ethernet, USB
Display	21.5 inch TFT multi-touch screen
Axes controlled	5 axes (simultaneously 4 axes)
Least input increment	0.01 μm
Least command increment	0.01 μm
Program memory capacity	1Gbyte
Input power source	3-phase 200/220V ±10%, 13.5kVA, 50/60Hz

■ Filtration device

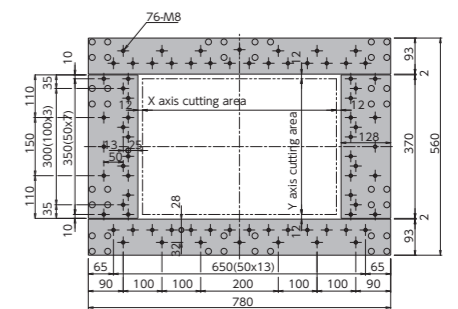
Model	MF890
Tank capacity	890L
Filter element	4 paper filters φ340×300mm
Deionizer	Ion-exchange resin 20L

M50B/MM50B

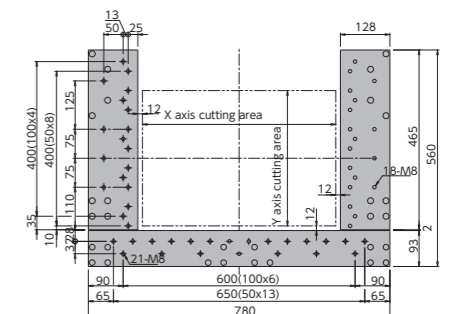
Specifications/
Dimension



■ Work Table

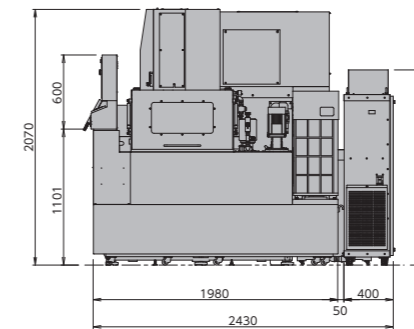
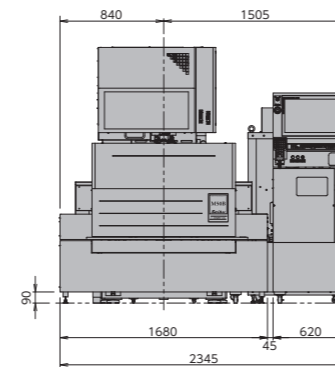


[MMB]

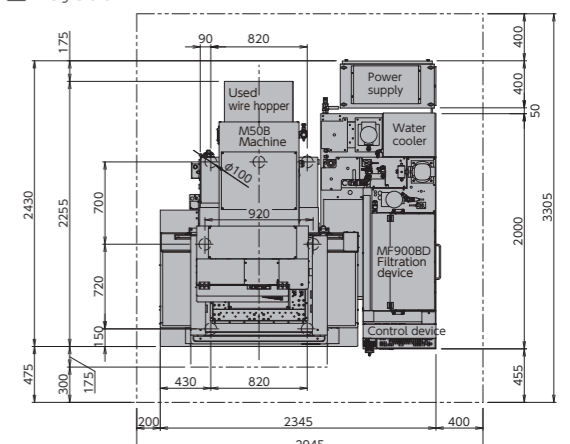


[MB]

■ Dimension



■ Layout



■ Standard Specifications

Model	M50B	MM50B
Max. workpiece dimensions W×D×H	800×650×300 mm	800×650×270 mm
Max. workpiece weight	800 kg	
Axis travel range X×Y×Z	500×350×310 mm	500×350×280 mm
Automatic wire feeding device	AWF-4 Equipped as standard	
U-V axis travel U×V	±60×±60mm	
Max. taper angle	±10°/work thickness300mm※	±10°/work thickness270mm※
Dimensions W×D×H	1,680×1,915×2,055 mm	
Weight	3,400 kg	

※±45° /40mm = option.

■ Wire diameter (φ0.2mm is standard.)

Model	MB	MMB
φ0.1mm~0.3mm		φ0.07mm~0.3mm

■ Control device

Model	SmartNC
Input system	MDI, Ethernet, USB
Display	21.5 inch TFT multi-touch screen
Axes controlled	5 axes (simultaneously 4 axes)
Least input increment	0.1 (MB) /0.01 (MMB) μm
Least command increment	0.1 (MB) /0.01 (MMB) μm
Program memory capacity	1Gbyte
Input power source	3-phase 200/220V ±10%, 13.5kVA, 50/60Hz

■ Filtration device

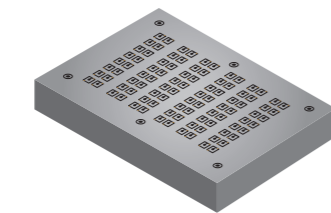
Model	MF900BD
Tank capacity	900L
Filter element	4 paper filters φ340×300mm
Deionizer	Ion-exchange resin 20L

Reduction of core processing time

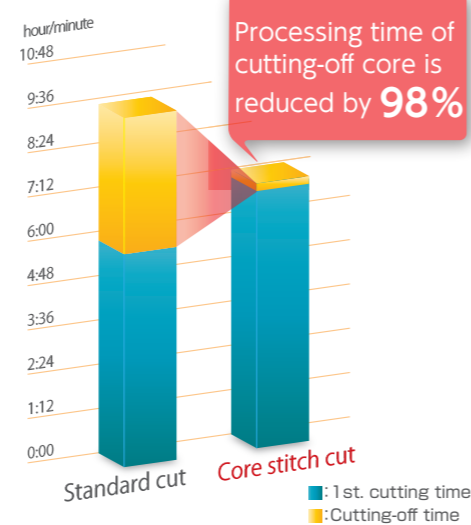
Core stitch function means that cutting-off process is not necessary! Instead of leaving uncut part, cutting can proceed while the brass wire weld's the slug in place.

You have only to tap on the core to remove it. This greatly reduces total machining time!

Data



Material : SKD11
Thickness : 20mm
Wire dia. : $\phi 0.2$ (brass wire)
Cutting shape : $\square 3\text{mm} \times 4\text{mm}$ (96pcs)
 $\phi 3$ (6pcs)



Problem and solution

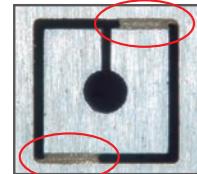
Portion left uncut



When operator completes the rough cut for all shapes leaving uncut part, he has to move the axis manually for each shape to finish the uncut part and has to remove the core.

- It requires human hand. So, the more shapes, the more time it requires.
- Operator's mistake tends to happen due to manual operation.
- Repeated simple task is troublesome.

Core Stitch



Since the brass can be welded on the part 1 mm from the upper face, it is possible to knock out the welded part by tapping on the slugs.

- You can solve the conventional problems quickly. (e.g. man-hour reduction, mistake prevention, relief of simple task)
- Simplification of NC program (Programming for uncut part is not necessary.)
- Simple task by only tapping on the core!



Cutting example and core stitch conversion software

Core stitch will analyze the NC program and automatically decide on the number of core stitches and their sizes and insert the code into the NC program.



Enlarged welded part



Core stitch conversion setting screen

Core Catch



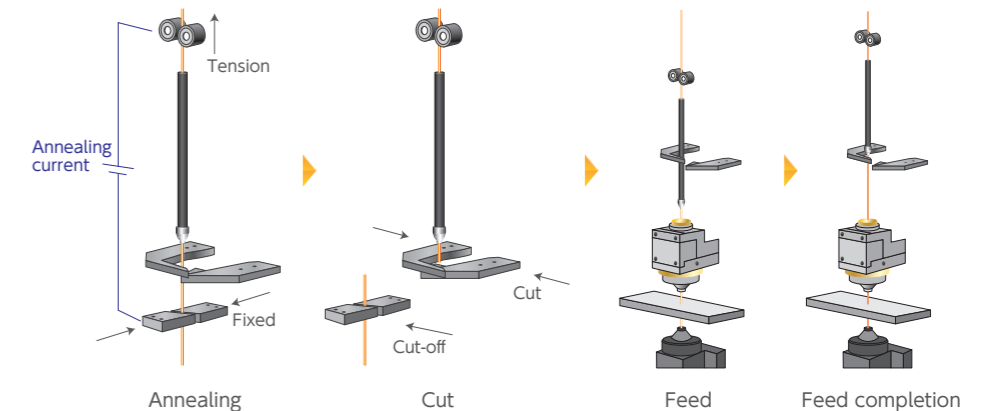
Core Catch enables you to process welded core automatically. The hammer mounted on upper head knocks off the core made after core stitch cutting and the core can be automatically collected. This fully automated process realizes unmanned operation for die plate finish cut.

Core Catch device

Greatly improved automation efficiency

We successfully developed the world's fastest AWF device in 1995. Our AWF features useful functions to enhance feeding efficiency and automatic operation ensures customer satisfaction.

Automatic wire feeding (AWF)



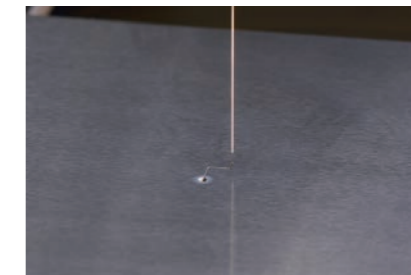
All-in-one AWF

Feed at wire break point



Wire can be reliably threaded even at the break point. This is an essential function for core stitch cutting.

Friction sensor



Using Seibu's patented "function sensor" technology, the wire can thread reliably through a start hole or the machining slot.

Wire feeding in water

It is possible to thread wire in water, through kerf slot due to anneal dry method.

Skip figure function

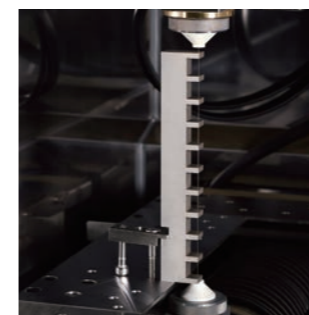
Automatic operation can continue without stopping even at an unexpected trouble.

Thin wire feeding

It contributes to the automatization of microfabrication.

Various functions

Reliable feeding to difficult workpiece



It is possible to feed automatically to the slit of comb-shaped workpiece with annealing and friction sensor.

Round diamond die guide



Lower guide

Upper guide

Accuracy-focused round guide has been adopted. (common to upper and lower guides)

Jet feed guide



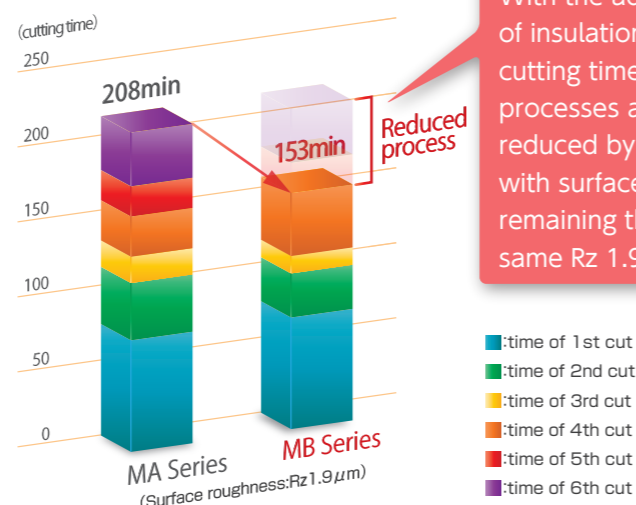
Water jet (option) is flushed from upper head nozzle to enhance the success rate of feeding. (Guides are not common to upper and lower guide.)

Insulation Table

Improvement of cutting surface finish

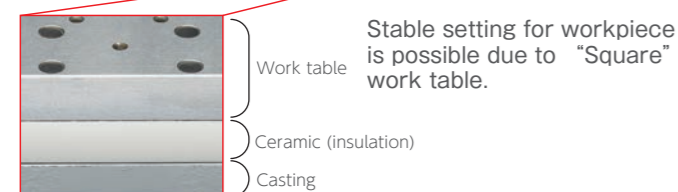
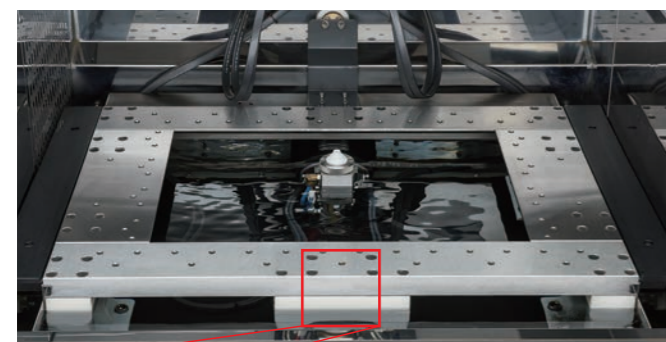
The insulation table reduces stray electric current, which improves the part's surface finish resulting in reduced cutting time.

Effect due to insulation table

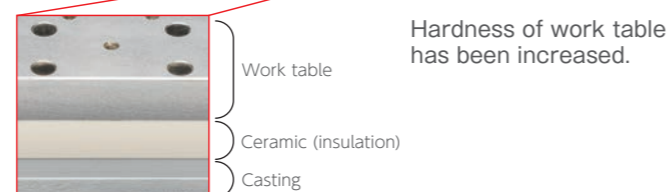
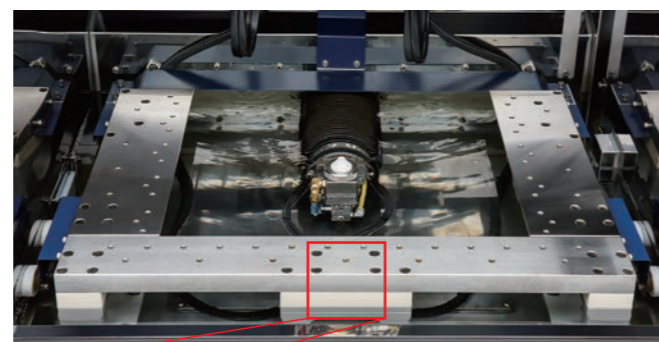


Work table

4 sided square shape work table



3 sided U shape work table



Work table for each model

Model	MB	MMB	Ultra MMB
Type of table			
Insulation	Standard		
Shape	3 sided U shape work table	4 sided squared shaped work table	

TOPICS

Cutting accuracy improved by laser measurement

All machines are measured by laser measuring equipment in $0.1 \mu m$ unit to achieve static accuracy.



*Laser beam is an image.

Precision Plate Cutting

Metal mold production without jig grinding machine

(UltraMM50B: cutting example)

Inserting the pins into three plates separately cut with different thickness (T20,22,25mm)

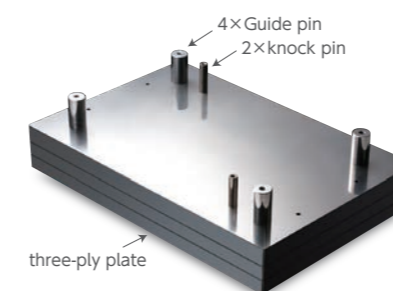
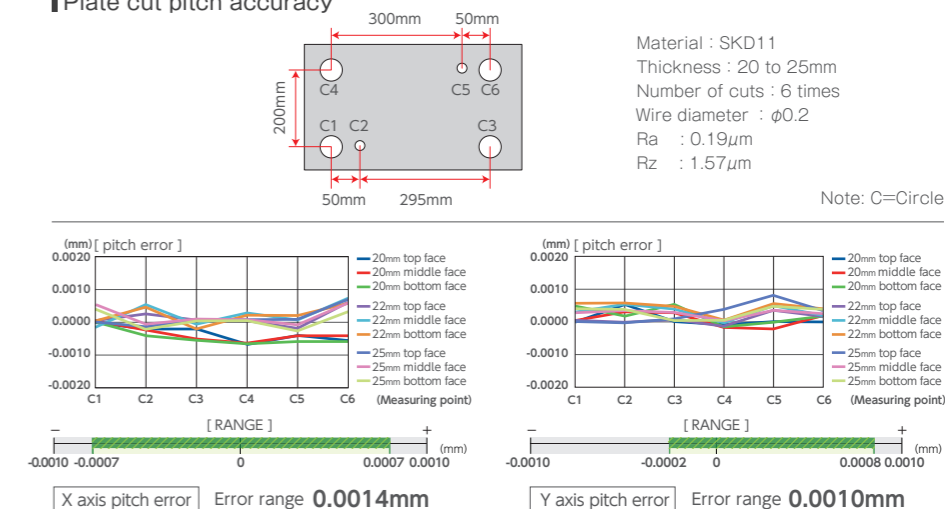


Plate cut pitch accuracy



Large plate cutting

(MM75B: cutting example)

Inserting the pins into two plates separately cut with different thickness

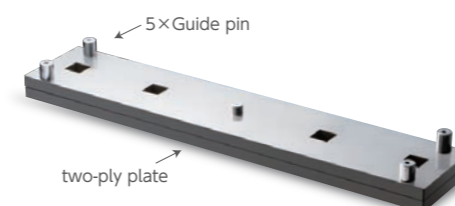
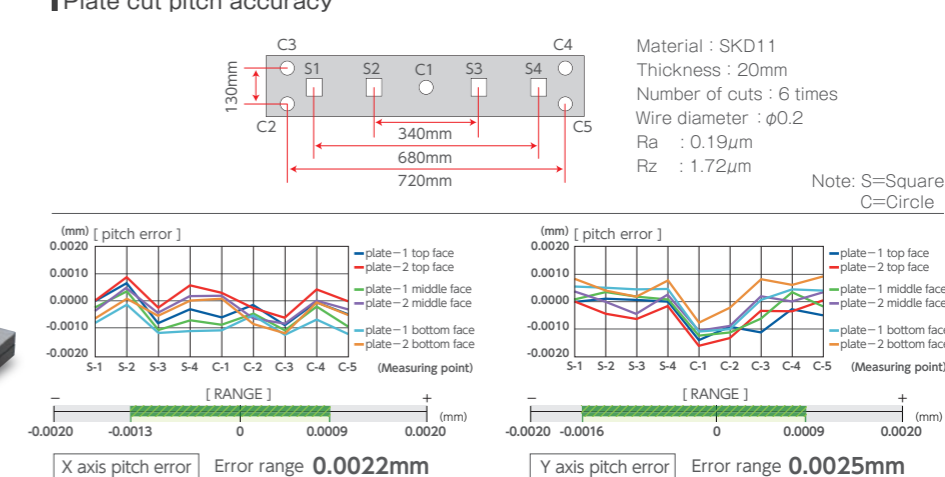


Plate cut pitch accuracy



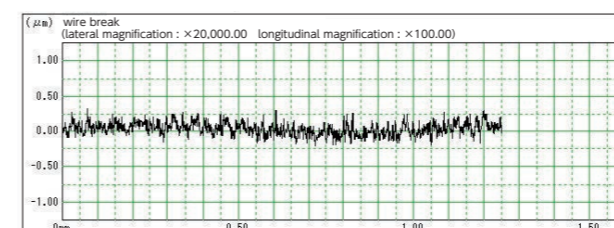
Best surface finish

Surface finishes of $R_z 0.5 \mu m$ or less was achieved thanks to the newly designed ceramic insulated table.

Material : SKD11
Thickness : 30mm
Model : UltraMM50B

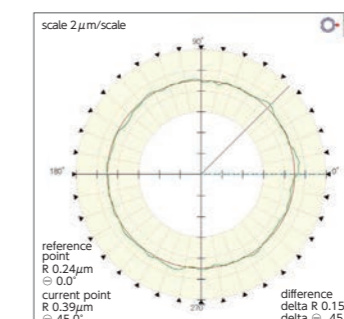
Number of cuts : 9 times
Wire diameter : $\phi 0.1$ (HBZ-SS)

surface roughness $R_a 0.064 \mu m$
 $R_z 0.448 \mu m$



Roundness

Straightness of XY axes has been improved and achieved roundness $0.81 \mu m$ by stable table feed.



Material : WC (G5)
nozzle state : lower nozzle off
Wire diameter : $\phi 0.2$ (HBZ-SS)
hole dia. : $\phi 10 mm$
Model : UltraMM50B

roundness $0.81 \mu m$

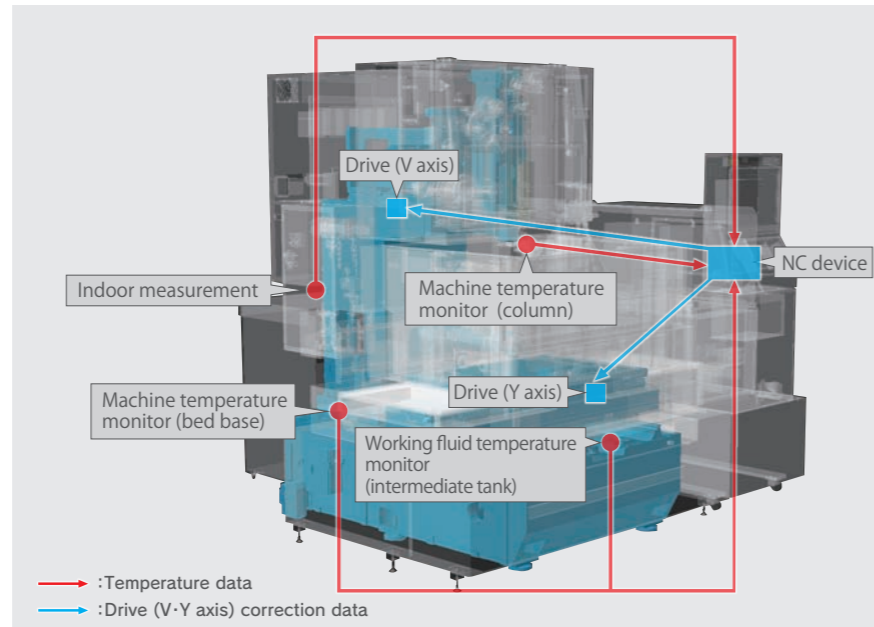
Thermal displacement can be corrected by NC.

Thermal Adjust 24 is a function to maintain wire verticality by correcting the thermal displacement caused by the temperature change between upper and lower head.



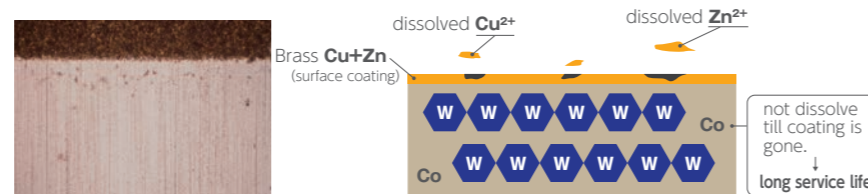
Temperature monitor screen

Wire alignment is improved by 62% using this function.

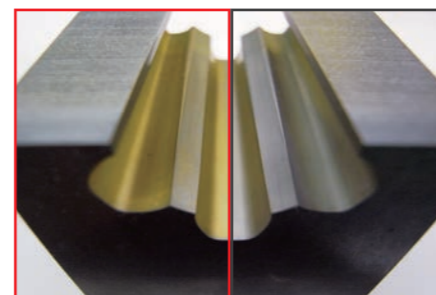


Measure against tungsten corrosion

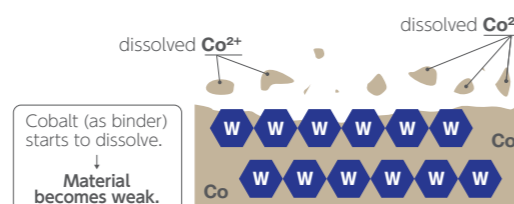
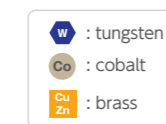
EL coating is a new technology that prevents cobalt (Co) from dissolving in water by means of coating the cutting surface with brass. This increases the life of the tool. This makes it possible to cut in water (not in oil), which reduces maintenance work.



with EL coating



without EL coating



When tungsten carbide material is cut in water, the cobalt (as binder) starts to dissolve in water. As a result, the material becomes weak.

EL Coating
Cutting surface is coated with thin brass layer.

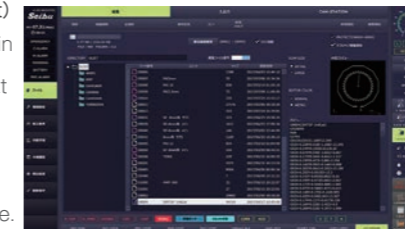
- Anti-corrosion is possible in water.
- Compared with cutting in oil, maintenance work is very easy.
- Equal life compared to the life of tool steel in oil.

Advanced NC

Large size multi touch panel (21.5") can access all operations like smartphone. Easy-to-use graphical screen is offered maintaining the existing operation system.

1:Edit(Program input·edit)

You can see programs in file directory at a glance by drawing result and text preview as with program number. Multi edit function is added, which enables to display and edit two programs at the same time.



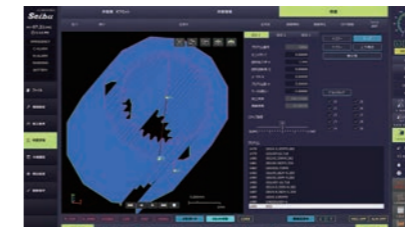
2:Cutting conditions

Optimum condition can be set instantly using powerful search engine.



3:Graphic display of plotting

The program can be checked on the plot page with high speed drawing. Scaling and rotation by multi touch. Easy check before cutting by step drawing.



4:Positioning

Various types of positioning are available. The setup before cutting improves efficiency.



5:Cutting

Cutting status can be checked graphically in real time by new navigation function and whole screen.



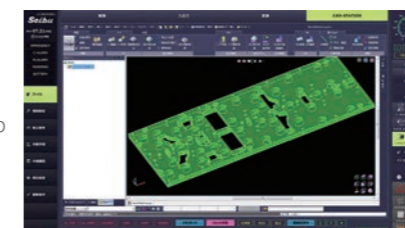
6:Maintenance information

Displays maintenance alert with an alarm. The alarm informs you of the time for parts replacement and the time for daily inspection.



CAM-Station (Option)

CAD data (2D/3D) is loaded by new CAM function, which enables to convert the data into NC program.



Seibu Machine Advanced Realize Technology **Smart NC**

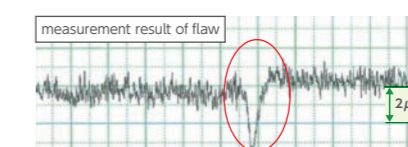
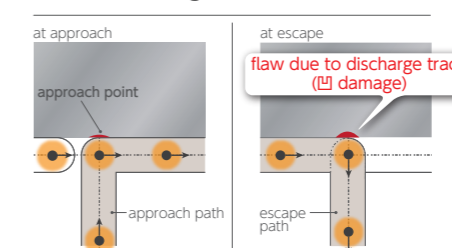
Function of reducing flaw of approach

In general cutting, the discharge flaw was caused by passing two approach points (at approach and at escape).

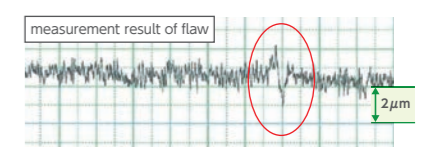
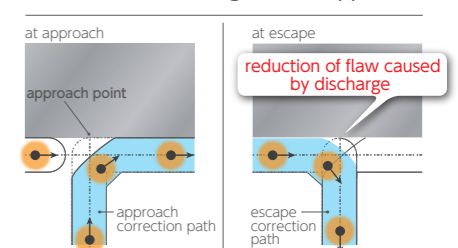
It is possible to reduce the flaw of approach part by correcting the path of both approach and escape.

For other correction function, corner shape correction and taper cut correction are available.

General cutting



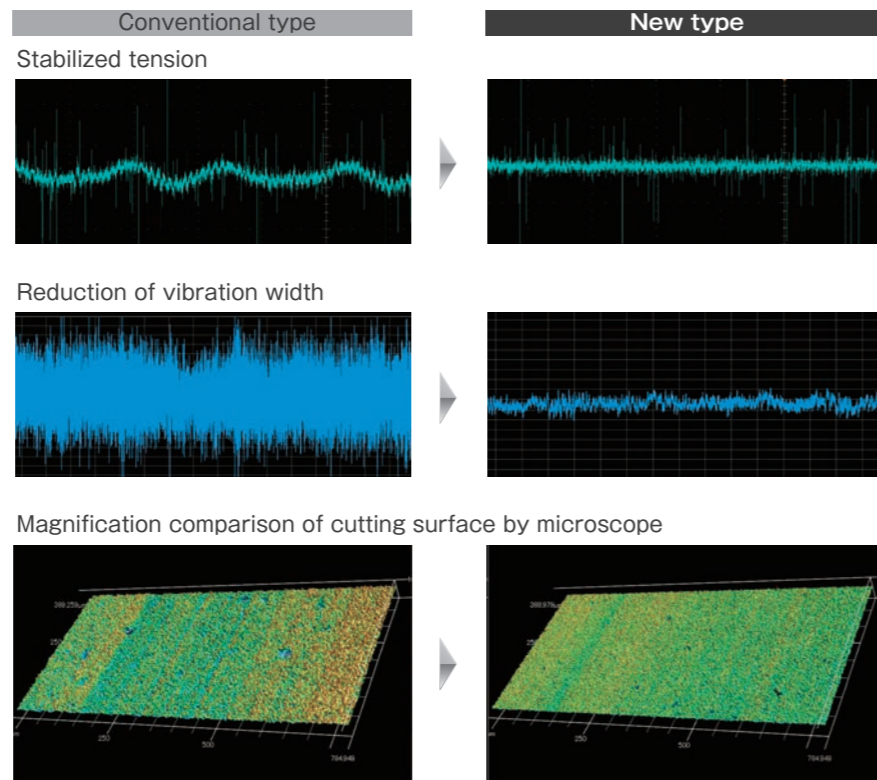
Function of reducing flaw of approach



Thin Wire Travel (for UltraMMB & MMB only)

Wire stable travel

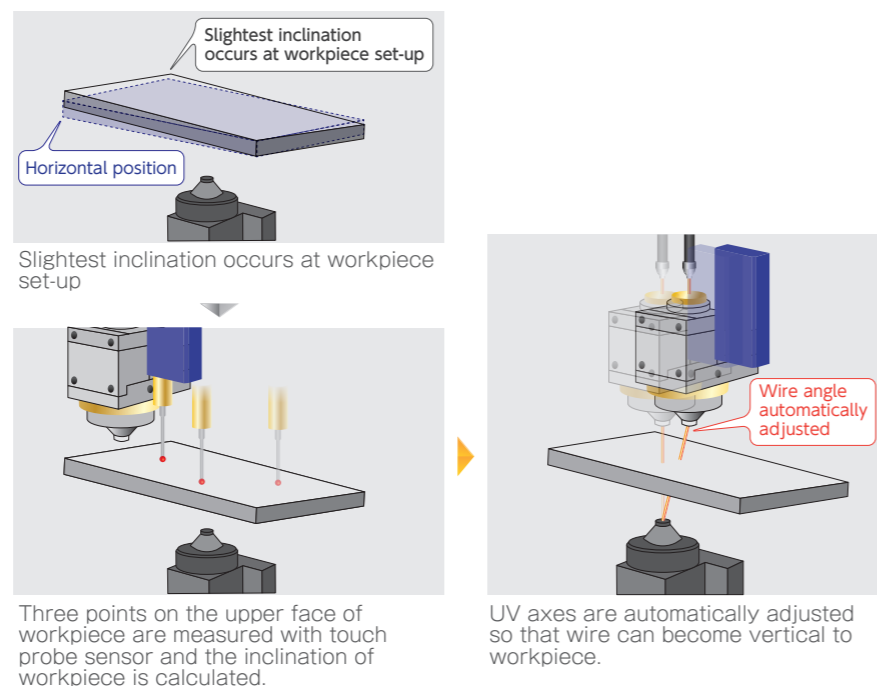
It became possible to stabilize the tension on the wire and reduce vibration at the time of machining, which has improved the quality of the machined surface.



3D Level Adjust (Option)

Automatic correction for vertical accuracy

Three points on the upper face of workpiece can be measured with high precision touch probe sensor mounted on the upper head. It is possible to adjust the wire verticality automatically with reference to the workpiece inclination to the work table. Spark positioning and horizontal adjustment jig becomes unnecessary due to this function, which reduces set-up time.

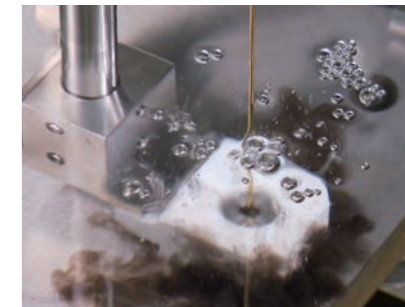
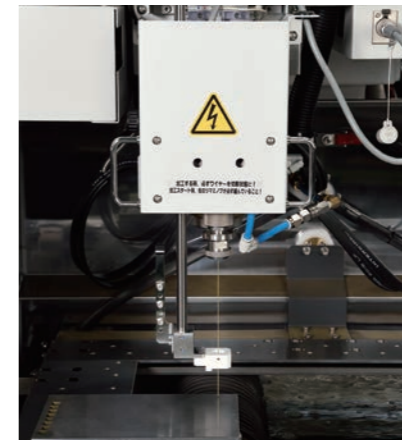


SHM (Option)

SHM = Simple type start-hole cutting device

SHM is a start-hole drill that can be easily mounted on a machine. Hole-drilling is possible for hardened workpiece or tungsten carbide (WC)

- standard $\phi 1.0$ pipe electrode
- Max. workpiece thickness 60mm
- cutting speed 10mm/min(SKD11)



Start hole cutting

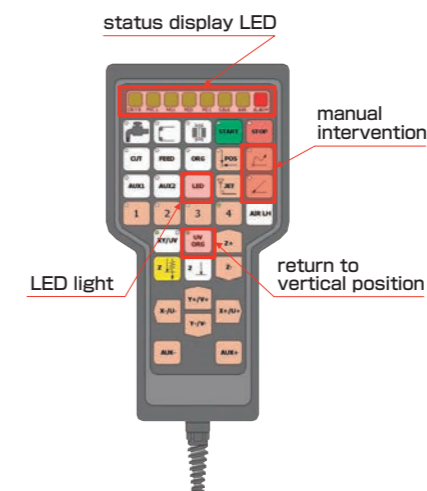
Start hole device (SHM) is Seibu original function.

New Pendant Switch Box

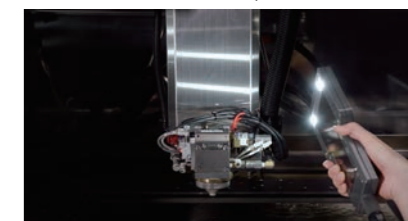
Improved operability

Operation has been improved by adding a manual hand pendant that is frequently used during cutting.

LED display by which each setting status can be checked, and high-brightness LED lamp (back face) for dark place are also provided.



New pendant switch

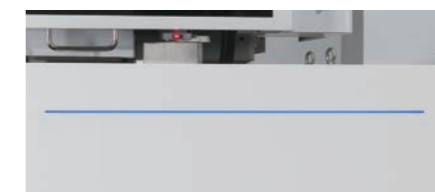


Back face LED light

Exterior Signal Light (Option)

Improved design

Integrated full-color LED on the work tank door makes it easy for the operator to view the machine's operating status.



Pause (blue)



Operation Mode (green)



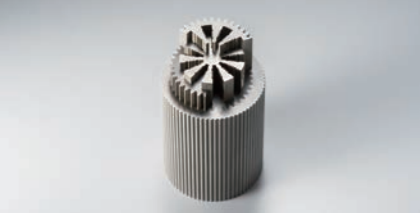
Temporary stop (yellow)



Alarm (red)

Cutting Samples

Combination cutting φ0.2



Material : SKD11 Surface roughness
Wire dia. : φ0.2 : Rz 2.0μm
Thickness : 60mm Cutting time : 50 hours

Thick punch out



Part accuracy (mm)			
	height	surface1	surface2
top	120	20.0000	19.9990
	90	19.9990	19.9992
middle	60	20.0000	19.9997
	30	20.0002	20.0000
bottom	0	20.0004	20.0002

Material : SKD11 Surface roughness
Wire dia. : φ0.2 : Rz 2.5μm
Thickness : 120mm Cutting time : 3.5 hours

Different thickness cutting



Material : SKD11 Surface roughness
Wire dia. : φ0.2 : Rz 3.0μm
Thickness : 20-30-40-60mm Cutting time : 22 hours

Best surface finish



Material : SKD11 Surface roughness
Wire dia. : φ0.1 : Rz 0.5μm
Thickness : 30mm Cutting time : 3 hours

High thickness taper combination cut



Material : SKD11 Surface roughness
Wire dia. : φ0.25 Cutting time : 4 hours
Thickness : 100mm Taper angle : 10°

Wide angle 45 taper cut

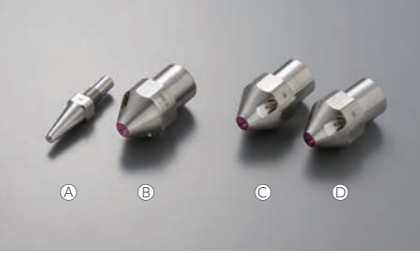


Material : SKD11 Surface roughness
Wire dia. : φ0.2 (Megacut-T) : Rz 4.5μm
Thickness : 40mm Cutting time : 5 hours

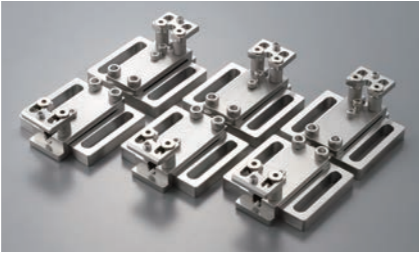
Options



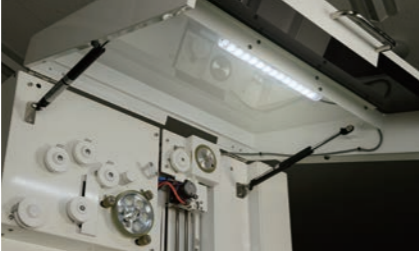
Automatic vertical square jig



Ⓐ:UDU die guide Ⓑ~Ⓓ:UD die guide



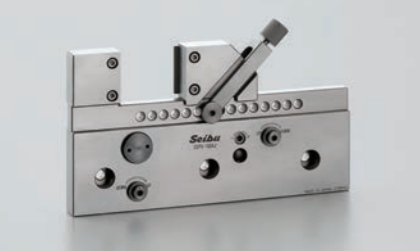
Height adjustment jig



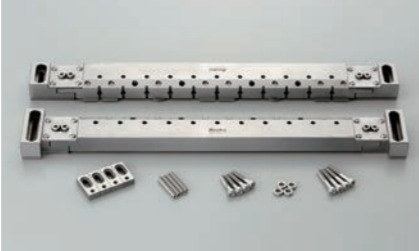
Internal lamp



20 kg roll wire feeder



Vice (SSPV-150AJ)



Bridge (SSBH-※※AJ (T))



Optional tool set

Options

◎Standard ○Option(available after shipment) ●Option(not available after shipment) ✕Not available

Options	MB	MMB	Ultra MMB	Remarks
X-Y linear scale	●	◎	◎	
U-V linear scale	●	●	◎	
Insulation table spec.	◎	◎	◎	Square shaped for UMMB&MMB, U shaped for MB
thin wire travel (twin tension type)	✕	◎	◎	Tension variation and wire vibration can be reduced.
φ0.10、φ0.15、φ0.25、φ0.30	○	○	○	You can choose the wire diameter. (φ0.20 is standard) ※1
φ0.05 thin wire specification	✕	✕	●	This is necessary when using φ0.05 wire.
φ0.07 thin wire specification	✕	●	◎	This is necessary when using φ0.07 wire.
φ0.10 thin wire specification	●	●	◎	This is necessary when using φ0.10 wire.
Suction unit of wire take-up for thin wire	●	●	◎	Wire can be easily discharged when using thin wire (0.05 to 0.1).
Jet feed unit for thin wire	●	●	●	Wire feeding can be helped by water jet when using thin wire (0.05 to 0.1).
20kg wire spooler	●	●	●	
Wide angle taper nozzle	○	○	○	Wide angle nozzle for standard die guide
Height adjustment jig	○	○	○	Jig for adjusting flatness when plate cutting.
Automatic vertical square jig	○	○	○	Wire verticality can be automatically measured.
Sub work table	○	○	○	
Bridge	○	○	○	
Vicw	○	○	○	
Start hole device (SHM)	●	●	●	Simple type start hole cutting device
Unit for mounting SHM	●	●	●	SHM function is available, but SHM device is not included.
Working fluid cooling device	●	◎	◎	Inverter working fluid cooling device
Deionizer	○	○	○	Including ion exchange resin 10L×2
Cartridge filter unit	○	○	✕	Removes sludge of cooling water for electric brush.
Sponge sheet for drain	○	◎	✕	Wire sludge can be removed.
Unit for filter replacement	○	○	✕	Auxiliary device for filter replacement
Specified color	●	●	●	
Exterior signal light	○	○	○	Integrated LED on the work tank front door enables operator to view the machine's operating status.
Internal lamp	○	○	○	LED lamp
External lamp for work tank	○	○	✕	LED lamp
Large taper cutting ※2	○	○	○	Large taper cut up to 45 degrees is available.
3D level adjust	●	●	●	Correction function for workpiece upper surface
3D level adjust plus	●	●	●	Probe measurement function is added to 3D level adjust.
Rotating device	●	●	●	
SF Unit	●	◎	◎	Unit for finish cut
EL coating	○	○	○	SF unit is required.
Power off unit	○	○	○	Power can be automatically cut off by the command of NC program.
External alarm output unit	○	○	○	This is an I/O unit for external signal.
Signal lamp (3 lamps)	○	○	○	Status display light
Core stitch	●	●	●	
Core stitch conversion soft	○	○	○	Program conversion software for PC
Core catch	●	●	●	Automatic device for core. This is used together with core stitch function.
Thermal 24	●	●	●	Monitors the temperature of machine inside and the ambient temperature.
Thermal Adjust 24	●	●	●	Can correct thermal displacement. This has to be used along with Thermal 24.
Inclination compensation software	●	●	◎	Can correct the pitch error of X,Y axes.
Straightness compensation software	●	◎	◎	Straightness of X,Y axes can be corrected.
CAM-Station	○	○	○	Integrated CAM software (2D data:CAD/CAM 3D data:CAM)
Optional tool set	●	●	●	

※1: Adjustment of automatic feeding is done for the specified diameter only before shipment.
If you think the other diameter may be needed in future, specify the diameter.

※2: This cannot be added after shipment when UV linear scale is necessary.

Details for each wire diameter

Wire diameter	Suction unit of wire take-up for thin wire	Jet feed unit for thin wire
φ0.05	◎	◎
φ0.07	◎	●
φ0.10	●	●
φ0.15~0.30	✕	●

CAD format CAM-Station

DXF,DWG,2D/3D-IGES
Parasolid,STL,SOLIDWORKS,STEP,IDI,BMI

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