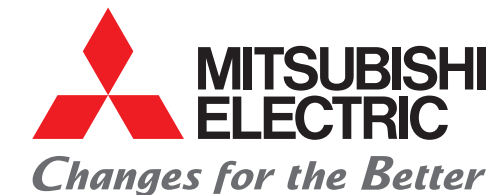
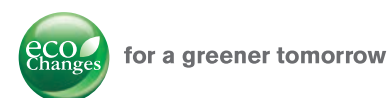


Global Partner. Local Friend.

MP Series



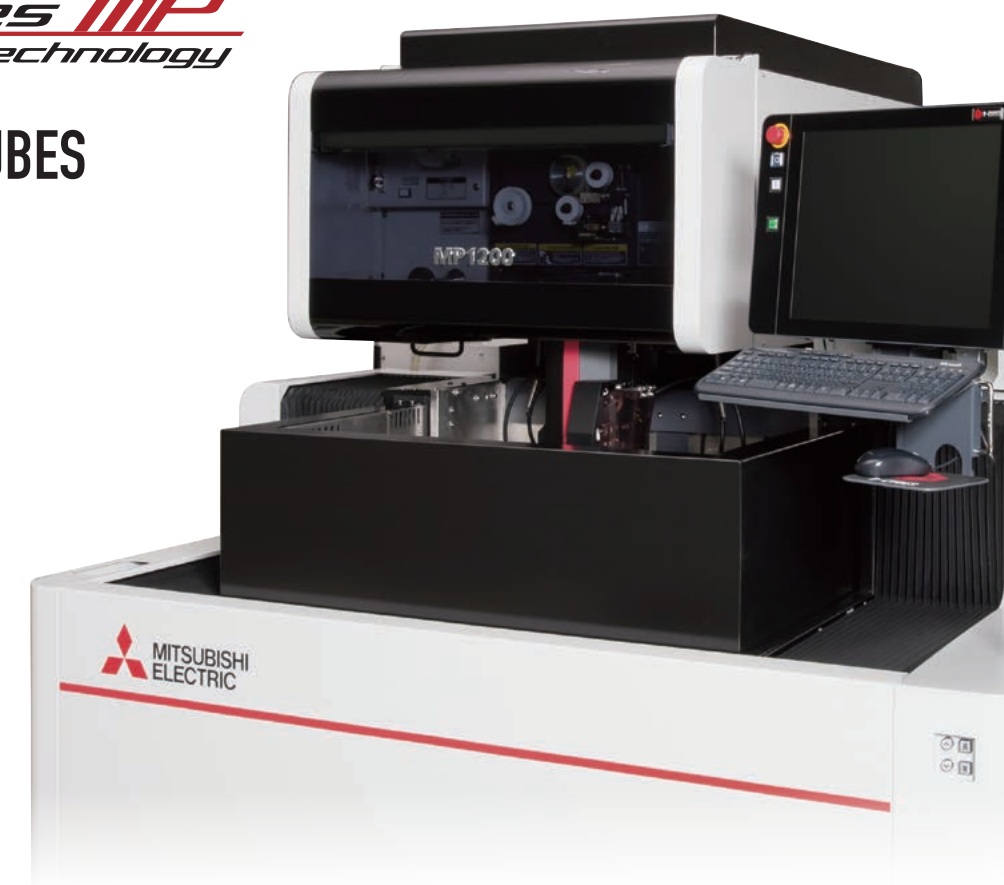
FACTORY AUTOMATION

Wire-cut EDM Systems MP Series

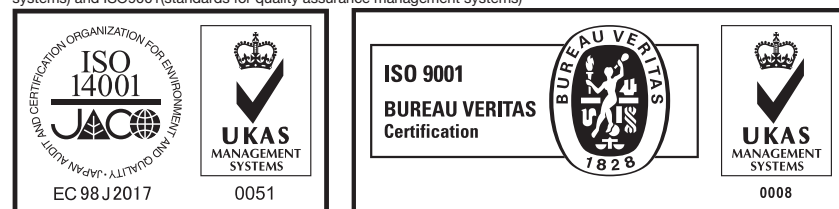
MP

series

series MP
Water Technology



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►MPSeries



GLOBAL IMPACT OF MITSUBISHI ELECTRIC



Through Mitsubishi Electric's vision, "Changes for the Better" are possible for a brighter future.

Changes for the Better

We bring together the best minds to create the best technologies. At Mitsubishi Electric, we understand that technology is the driving force of change in our lives. By bringing greater comfort to daily life, maximizing the efficiency of businesses and keeping things running across society, we integrate technology and innovation to bring changes for the better.

Mitsubishi Electric is involved in many areas including the following

Energy and Electric Systems

A wide range of power and electrical products from generators to large-scale displays.

Electronic Devices

A wide portfolio of cutting-edge semiconductor devices for systems and products.

Home Appliance

Dependable consumer products like air conditioners and home entertainment systems.

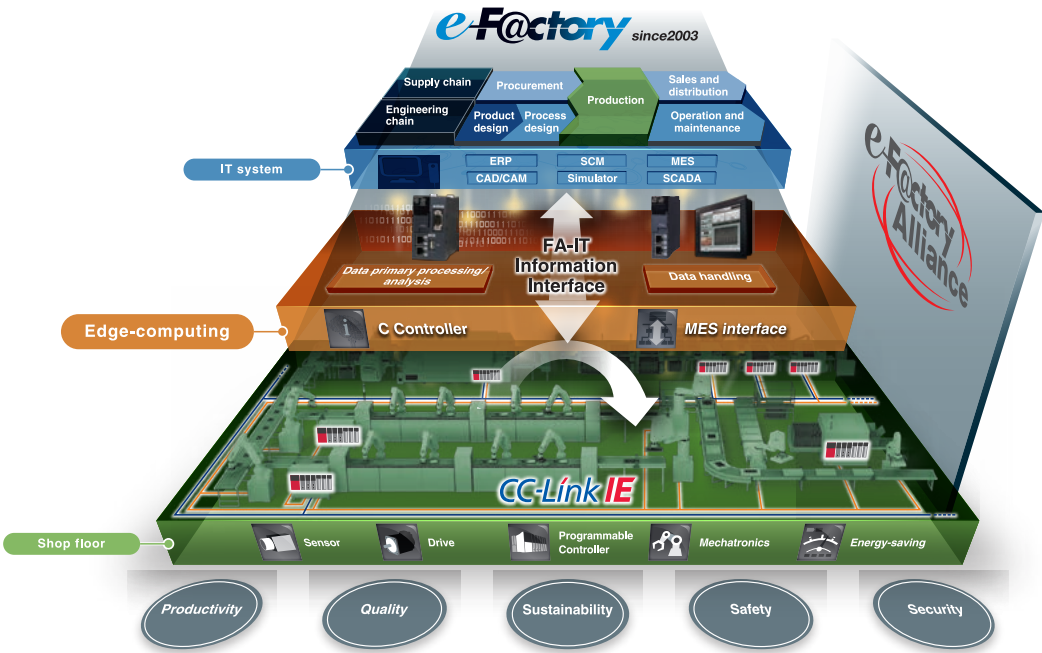
Information and Communication Systems

Commercial and consumer-centric equipment, products and systems.

Industrial Automation Systems

Maximizing productivity and efficiency with cutting-edge automation technology.

Mitsubishi Electric continues the challenge to be the only one FA machine and systems supplier delivering total customer satisfaction.



Mitsubishi Electric is a world-leading general electrical and electronic products manufacturer with wide-ranging business reach, from appliances for the home to systems used in outer space. Global-scale business development is in five business domains: heavy electrical machinery and systems, industrial automation, information and communication systems, electronic devices, and home appliances. Producing general electrical machinery for over 90 years, as Mitsubishi Electric's Factory Automation Systems Business Group, we have supported manufacturing in Japan, China, and Asia, and around the globe. In doing so, we have accumulated and refined technologies for FA control, drive control, automation, and manufacturing that are utilized to expand and improve a vast product lineup, such as controllers, drives, and automation and power distribution control products. In addition to product components like those listed above, we are quick to propose systems such as e-F@ctory and iQ Platform as solutions for production site innovation. As a comprehensive supplier of FA products and systems, Mitsubishi Electric will continue to respond to the voice of customers and deliver products of the utmost quality throughout the world.

INDEX

1. History of Wire-cut EDMs	3	8. Automatic Wire Threading	21
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Outstanding accuracy for the most
critical application in the field of world.

MP series

Wire-cut EDM to meet to anticipations for ultrahigh accuracy

SERIES MP
Water Technology



MP Series

Wire-cut EDM Systems Lineup

Model lineup covers your machining needs from parts production machining to super-accurate mold making

Ultrahigh precision machines

MX 600 Oil

Flagship model incorporating extreme precision machining



MP Series *SERIES MP Water Technology*

Flagship model incorporating extreme precision machining



PA05S ADVANCE

Flagship model incorporating extreme precision machining



Highperformance machine



MV-R Series

High performance model innovating next-generation high-performance machine

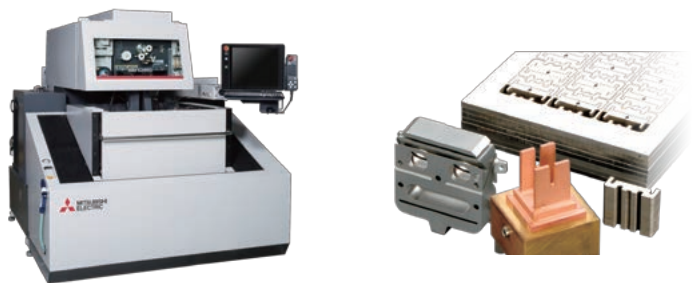


Highproductivity machine



MV-S Series

Standard model pursuing a cost performance standard machine



Product Lineup



series *MP*
Water Technology

MP1200

D-CUBES

4-axis LSM (XYUV linear shaft motor)

Four-sided hardened table

Machining accuracy $\pm 2\mu\text{m}$ achieved (Note 1)
(Note 1) The machining accuracy follows the Mitsubishi Electric machining conditions.

(Automatic elevation tank)

series *MP*
Water Technology

MP2400

D-CUBES

4-axis LSM (XYUV linear shaft motor)

Four-sided hardened table

Machining accuracy $\pm 2\mu\text{m}$ achieved (Note 1)
(Note 1) The machining accuracy follows the Mitsubishi Electric machining conditions.



(Automatic elevation tank)

Accuracy guarantee confirmation shape

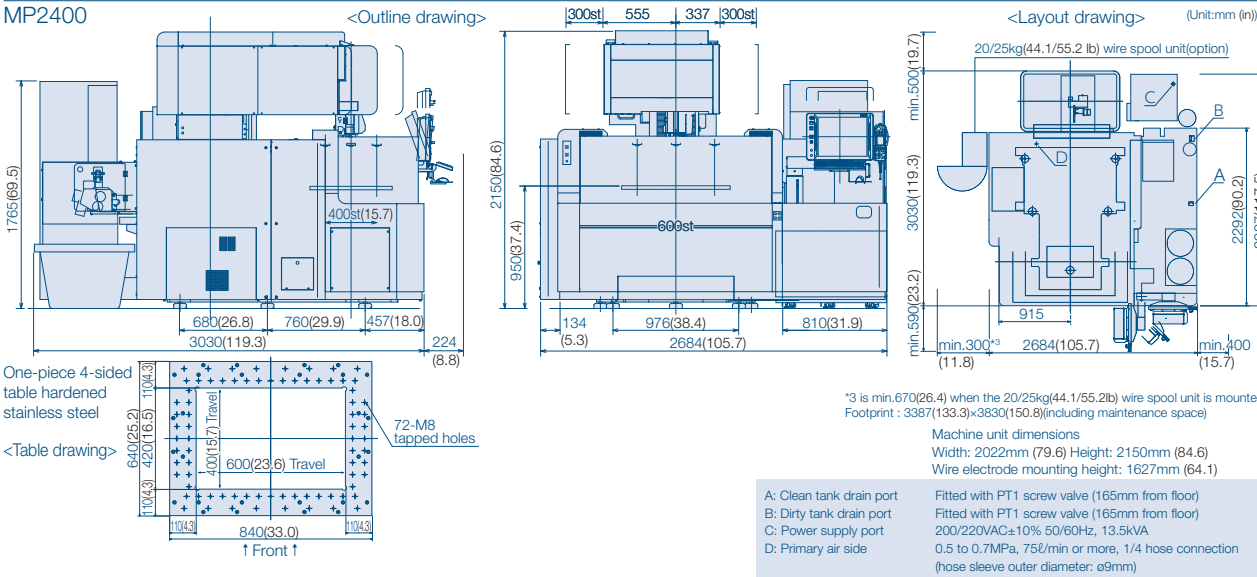
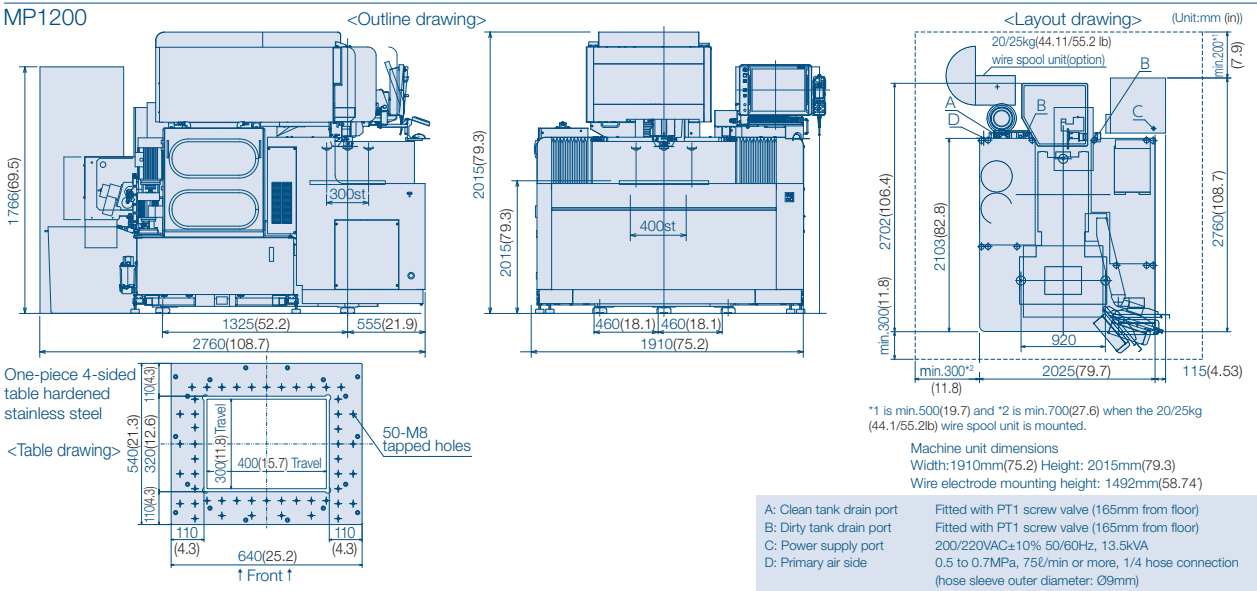
● Workpiece:
Steel (PD613 t20mm(0.79")
(SKD11 improved steel))
HRC56-57 after quenching the workpiece,
sub-zero treatment, high thermal
tempering, stabilizing treatment
and demagnetization are conducted.

● Wire electrode: $\varnothing 0.2(0.008")/BS$

● Room temperature: $20^{\circ}\text{C}\pm 1^{\circ}\text{C}$

Unit: mm

Thickness: 20mm



Standard machine specifications			
Machine unit	Model	MP1200	MP2400
	Max. workpiece dimensions [mm](in)	810(31.9) \times 700(27.6) \times 215(8.5)	1050(41.3) \times 820(32.3) \times 305(12.0)
	Max. workpiece weight [kg](lb)	500(1102)	1500(3307)
	Table dimensions [mm](in)	640(25.2) \times 540(21.3) (4-sided)	840(33.1) \times 640(25.2) (4-sided)
	Machine travels (X \times Y \times Z) [mm](in)	400(15.7) \times 300(11.8) \times 220(8.7) (XY axis OPT-drive specifications)	600(23.6) \times 400(15.7) \times 310(12.2) (XY axis OPT-drive specifications)
	Machine travels (U \times V) [mm](in)	$\pm 60(2.4)\times\pm 60(2.4)$ (OPT-drive specifications)	$\pm 75(2.9)\times\pm 75(2.9)$ (OPT-drive specifications)
Dielectric fluid reservoir	Max. taper angle [°]	15°(max. 200mm(7.9"))	15°(max. 260mm(10.2"))
	Wire diameter [mm](in)	0.1(.004)–0.3(.012)*1	
	Weight [kg](lb)	3100(6834)(including dielectric fluid reservoir)	4100(9039)
	Tank capacity [ℓ](US gal)	550(145)	800(211)
	Filtration method	Paper filter (2)	
	Filtered particle size [μm]	3	
	Water purifier (on exchange resin) [ℓ](cu.ft.)	10(0.35)	
	Dielectric fluid chiller unit	Unit cooler	
	Weight (dry) [kg](lb)	— (included in the machine unit weight)	
		350(772)	

*1 $\varnothing 0.2(0.008")$ DD guides and $\varnothing 1.5(0.06")$ jet nozzle are standard equipment.

General input		[kVA]	13.5
Required air rate	Air pressure [MPa](psi)	0.5(72.5)–0.7(101.5)	
	Air rate [ℓ](cu.ft.)/min	75(2.65) or more	

Standard functions	Option
<div><div>• Automatic wire threading</div><div>• Digital-AEII power supply</div><div>• LAN/W (Ethernet)</div><div>• FTP/DNC (S/W)</div><div>• Angle Master (S/W)</div></div>	<div><div>• Anti-virus protection</div><div>• Sleep mode</div><div>• Super-DFS power supply</div><div>• Built-in scheduler</div></div> <div><div>• $\varnothing 0.05, \varnothing 0.07$ Automatic wire threading</div><div>• Angle Master ADVANCE II (S/W)</div><div>• Angle Master ADVANCE II dice kit $\varnothing 0.25$</div><div>• Angle Master ADVANCE II dice kit $\varnothing 0.25$</div></div> <div><div>• Option Box</div><div>• 20/25kg(44.1/55.2lb) wire spool unit</div><div>• External signal output</div><div>• Built-in warning light</div><div>• Run timer</div></div> <div><div>• 4-piece filter system</div><div>• Filter automatic switching (4-piece filter system)</div><div>• Temperature monitoring function</div></div>

Detail on the other page.

Product Lineup



(Automatic elevation tank)

SERIES MP

Water Technology

MP4800

D-CUBES

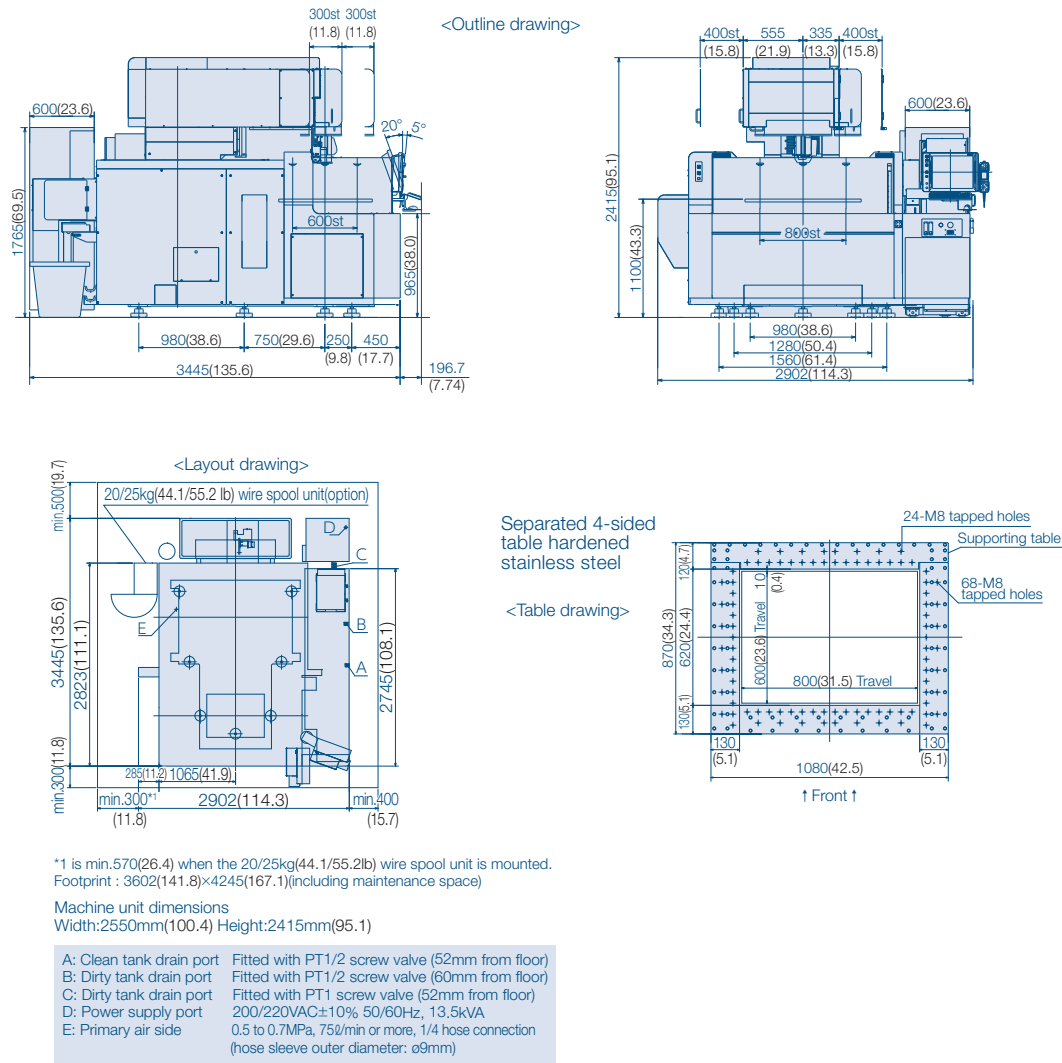
4-axis LSM (XYUV linear shaft motor)

Separated 4-sided hardened table

Machining accuracy ±2μm achieved

(Note 1) The machining accuracy follows the Mitsubishi Electric machining conditions.

MP4800



Functions and Features

Fully equipped with useful functions for the manufacturing workplace, featuring refined style, high performance, energy savings, simple operation and vast expertise.

MP1200/MP2400/MP4800



series MP
Water Technology



Machining accuracy

ODS Opt Drive System [Refer to page 17-20](#)

- Equipped with a linear shaft motor(LSM)
- Circular accuracy within 1μm is realized using optical drive system(ODS).

servo AMP

D-CUBES New controller

LSM with linear glass scale feedback

LSM with linear glass scale feedback

Thickness (mm)	Surface roughness (μm) - PF circuit	Surface roughness (μm) - S-DFS
20	~4.5	~3.5
60	~4.5	~3.5
100	~4.5	~3.5
150	~4.5	~3.5
200	~4.5	~3.5

Automatic wire threading

Intelligent AT [Refer to page 21-22](#)

- New annealing system greatly improves wire threading with a curl ratio of less than 10%.
- Wire break point insertion is greatly improved for thick workpieces.
- Wire threading suitable for workpiece shape. (jet on/off and submerged break point insertion)

▲Video of automatic wire threading

Productivity

PFC Precise Finish Circuit [Refer to page 23-24](#)

- MP Water Technology increased Tungsten Carbide Productivity up to 30% from the conventional oil dielectric fluid wire-cut EDM.
- Newly added Built-in scheduler function

Easy and flexible multiple program operation.

MP Water Technology **Up to 30% Faster**

Conventional (Oil)

Machining Speed
Ø0.20 (.008") BS Wire, Tungsten carbide/thickness 60mm(2.36")

Built-in scheduler

Built-in CAD

Operability

NUI Natural User Interface [Refer to page 25-28](#)

- Information is displayed on a large 19-inch screen.
- Functions to be viewed or used are called by one touch from the HOME screen.
- The number of operations performed on the Navigation menu from setup to machining is reduced by almost 40%. (as compared to the past)
- Setup performance is improved by a thin hand pendant box with LED.

Energy savings, low operating cost

LLS Long Life System [Refer to page 29-30](#)

- The operating cost of the machine can be viewed on the cost management screen. This is useful for budget planning.

Power monitor

Machining results monitor

series MP
Water Technology

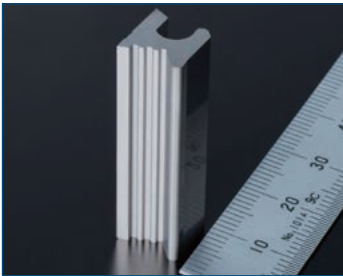
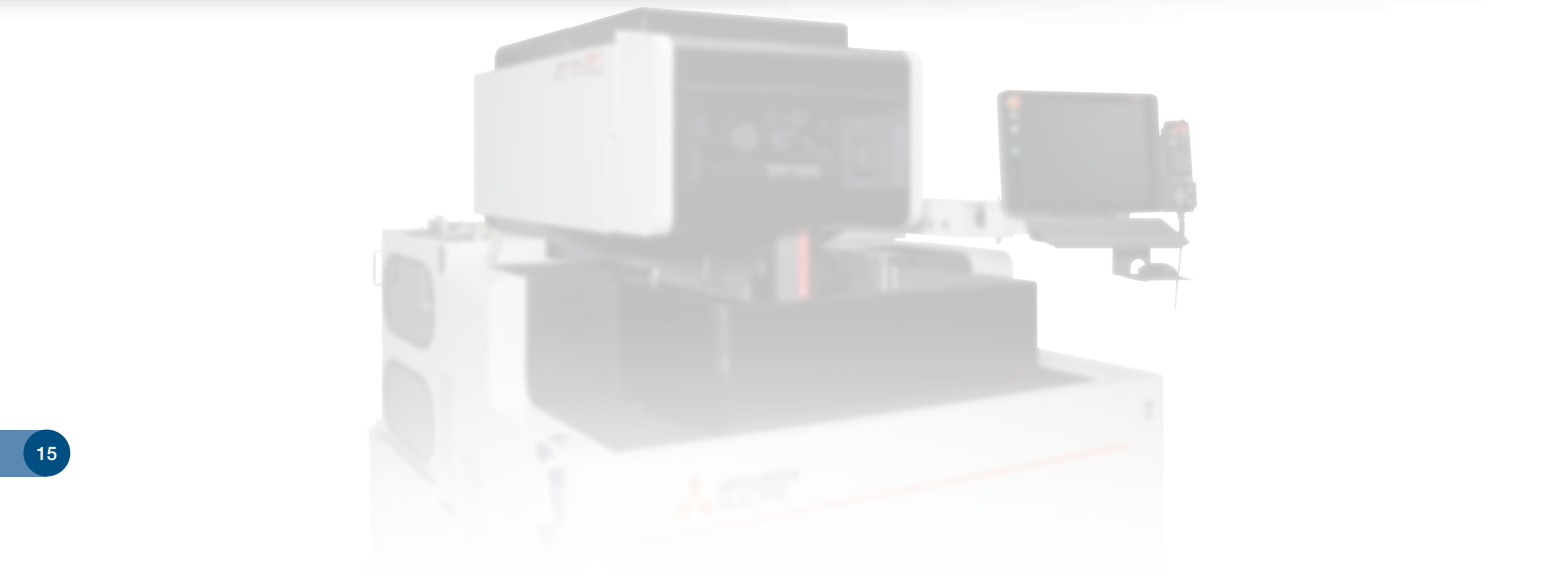
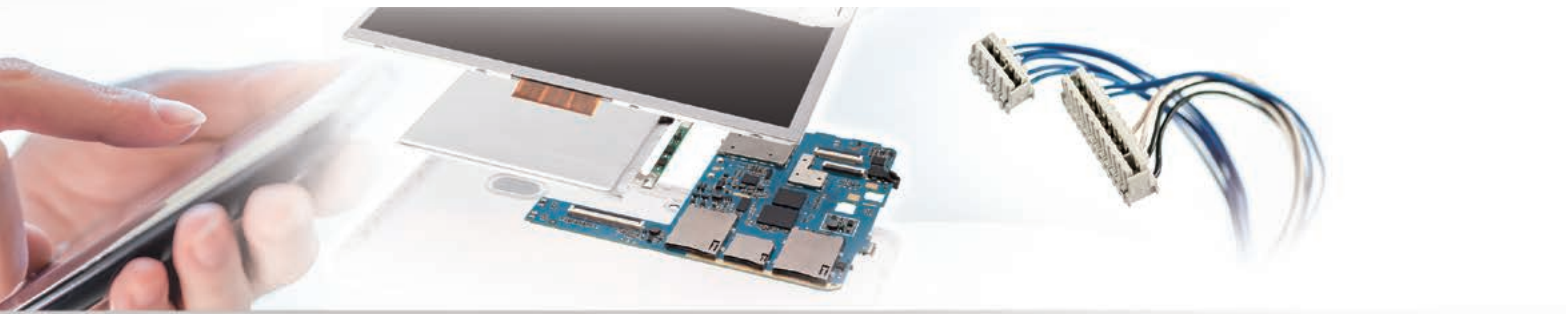
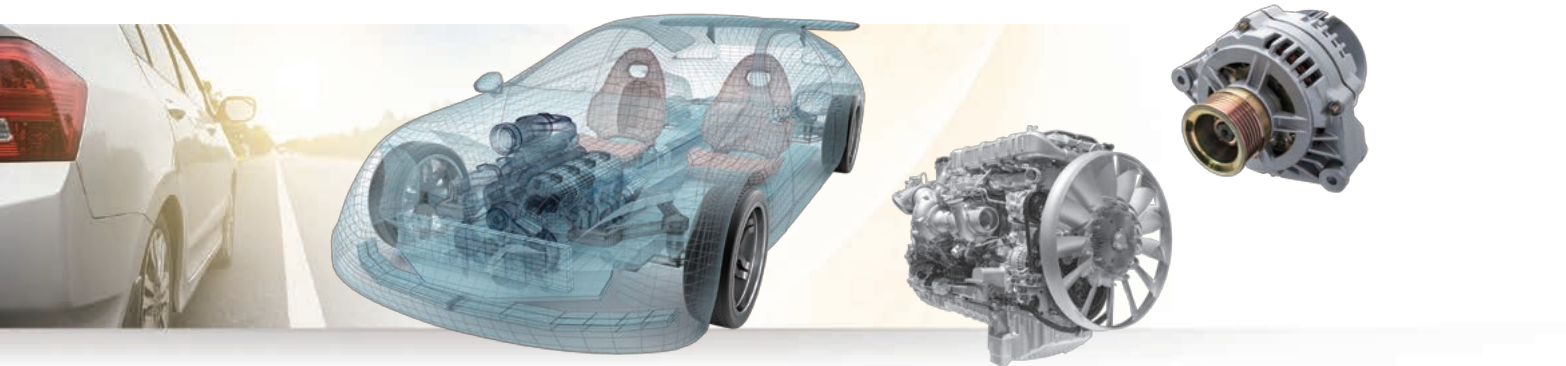


Sample

Next-level machining that adds extra value to your products



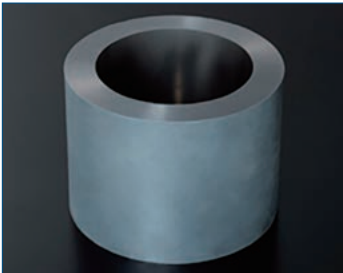
Machining samples



Ra0.08μm finish tungsten carbide machining

Model	MP1200
Electrode material	Ø0.2(.008")/BS
Workpiece	Tungsten carbide
Workpiece thickness	35mm(1.38")
Surface roughness	Rz0.7μm/Ra0.08μm
Machining accuracy	Corner accuracy 2μm(.00008")

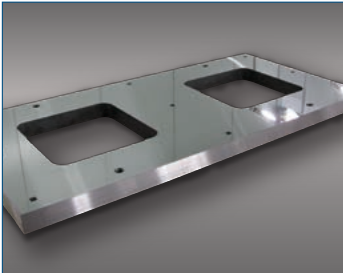
- High speed fine surface finishing is possible by super finish power supply (Super-DFS power supply).
- Machining accuracy of 2μm or less for various size of corners is realized by updated CM control.



1.3μm roundness circular machining

Model	MP2400
Electrode material	Ø0.2(.008")/BS
Workpiece	Tungsten carbide
Workpiece thickness	80mm(3.15")
Surface roughness	Rz0.6μm/Ra0.08μm
Machining accuracy	Roundness 1.3μm straightness 1.3μm

- Rz0.6 μm is realized by the advanced Super Digital-FS(SDFS) power supply.
- High circular accuracy is realized by ODS and entranced EM control.



±1.5μm accuracy pitch machining

Model	MP4800
Electrode material	Ø0.2(.008")/BS
Workpiece	Steel(SKD11)
Workpiece thickness	30mm(1.18")
Surface roughness	Rz1.8μm/Ra0.22μm
Machining accuracy	Pitch accuracy ±1.5μm(.00006")

- Stable high accuracy machining is realized by ODS, improvement of axis movement accuracy and dielectric fluid control.
- Stable automatic wire threading is realized by Intelligent AT even in multi-shape machining.



Fine shape machining

Model	MP1200
Electrode material	Ø0.05(.002") /Sumi sparkγM
Workpiece	Steel
Workpiece thickness	0.5 ~ 1.0mm
Surface roughness	Rz0.80μm/Ra0.10μm
Machining accuracy	Shape accuracy ±1μm(.00004")

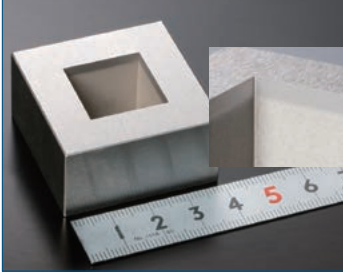
- High speed fine surface finishing is possible by super finish power supply (Super-DFS power supply).
- Shape accuracy of ±1μm in the L/D = 20 (pin width: 0.12mm, pin length: 2.4mm) is realized by NL control.



±1.5μm straightness tall punch machining

Model	MP2400
Electrode material	Ø0.2(.008")/MEGACut TypeA
Workpiece	Steel(SKD11)
Workpiece thickness	100mm(3.93")
Surface roughness	Rz0.8μm/Ra0.10μm
Machining accuracy	Straightness ±1.5μm(.00006")

- Straightness of ±1.5μm(.00006") is possible even with a 100mm (3.94") thick workpiece.
- High-accurate straightness is realized by shape control power supply. (Digital-AEII power supply)
- Rz0.8 μm is realized by the advanced Super Digital-FS(SDFS) power supply.



Uniform land cut machining

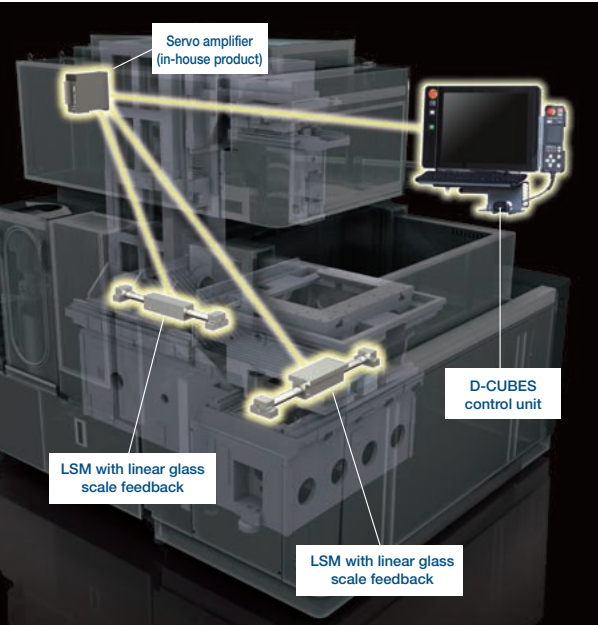
Model	MP1200
Electrode material	Ø0.2(.008")/BS
Workpiece	Steel(SKD11)
Workpiece thickness	30mm(1.18")
Surface roughness	Rz2.5μm/Ra0.32μm
Machining accuracy	—

- High accuracy machining with uniform land height is possible by Angle Master ADVANCE II.
- Enhanced accuracy machine movement by XYUV LSM and the round guides.
- Angle Master ADVANCE II <Option>



Machining Accuracy

Next-generation drive system and optimum machine structure

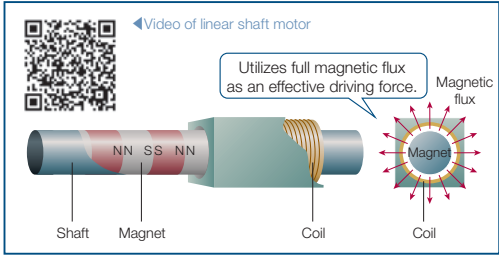


Optical Drive System

- High-speed fiber-optic communications and a linear shaft motor synergistically improve machining accuracy.
- A servo amplifier and control unit developed by Mitsubishi Electric contribute to system optimization.

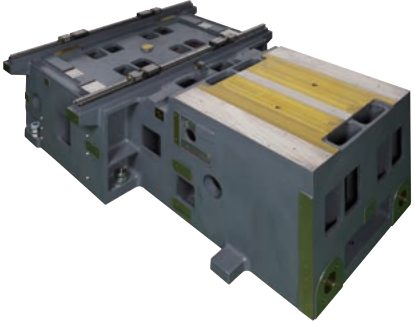
Linear Shaft Motor(LSM)

- Power consumption is reduced by utilizing a full 360° magnetic flux as the effective driving force.
- Highly accurate axis movement is possible without any backlash.
- Non contact power transmission ensures stable and accurate axis movement for many years.



Highly rigid structure

- MP1200 utilizes a split X/Y-axis construction method allowing both to be directly mounted to the T-shaped base casting for optimum stability. This combination moves the table in the X-axis and the column in the Y-axis.
- MP2400 utilizes a fixed table traveling column design for improved accuracy in large heavy workpieces.



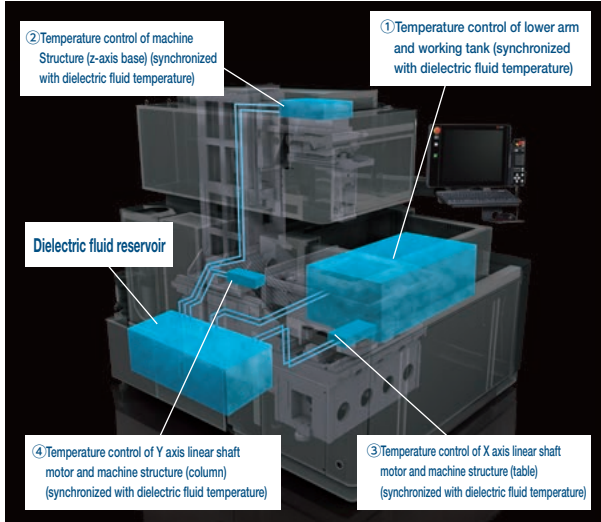
Axis movement accuracy

- This effort ensures precise linear movement by reducing waving of the linear guide.
- Ultra-high accuracy linear guides are carefully installed on precisely machined mounting surfaces to provide straightness accuracy of 1 - 2μm.



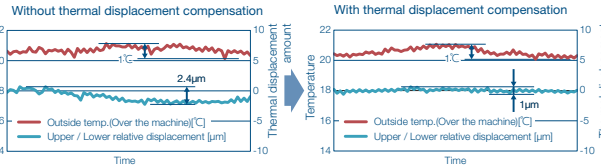
Thermal Stability System

- This process is synchronized through thermal sensors on the machine casting while circulating the fluid through key areas of the machine structure (Thermal buster).
- A chiller system is used to cool the dielectric fluid to remove the heat generated by the EDM machining process.



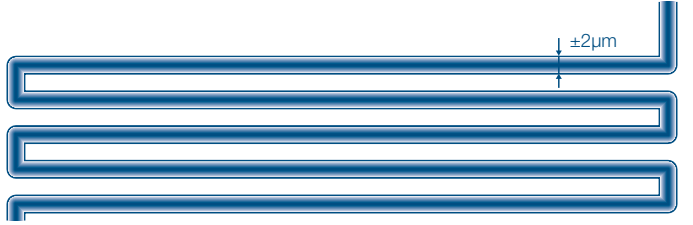
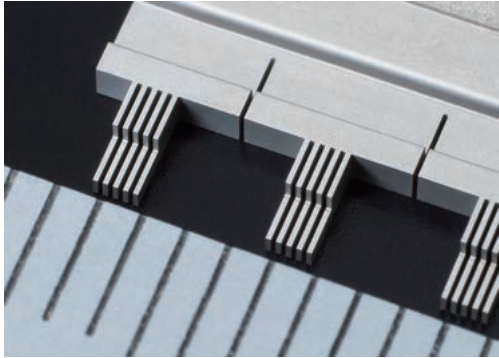
Dynamic thermal protection (DTPro) (Dielectric fluid temperature control and Thermal displacement compensation function) (MP4800)

Controlling temperature of machine structure synchronized with dielectric fluid temperature, stabilizing accuracy machining for a long period time by controlling relative displacement of upper and lower guides.



Sample

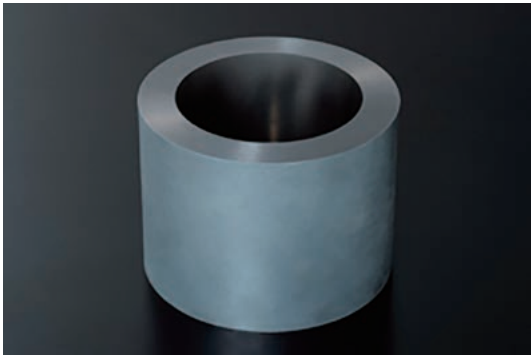
Connector (MP1200)



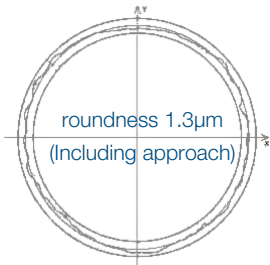
- 10% improvement in high-speed machining compared to conventional models.
- ±1μm accuracy even in the L/D=20 machining under the nozzle away condition.
- Wire marks on the finished surface is greatly reduced by the new servo "NL control".

Workpiece	Steel
Workpiece thickness	0.5~1.0mm(.02~.04")
Electrode material	Ø0.05(.002")Sumi sparkγM
No. of cuts	10 times
Surface roughness	Rz0.8μm Ra0.1μm
Machining accuracy	±1μm(.00004")

Roundness (MP2400)



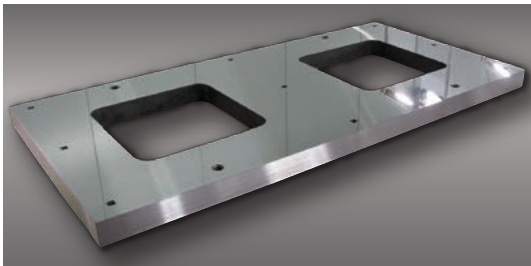
- Ra0.08μm surface finish is realized using Super-DFS power supply.
- Enhanced EM function is used to reduce the over cut of approach point.



Workpiece	Tungsten carbide
Workpiece thickness	80mm(3.15")
Electrode material	Ø0.2(.008")BS
No. of cuts	13 times
machining time	29.5hr
Surface roughness	Rz1.8μm Ra0.22μm
Straightness	1.3μm

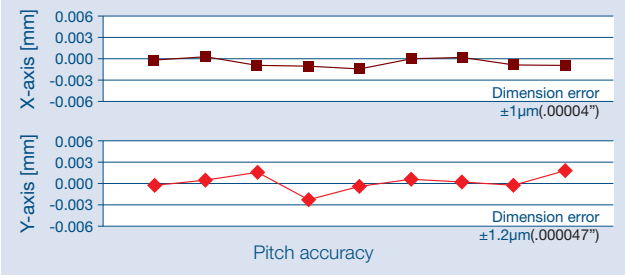


Pitch (MP4800)



- High-accuracy machining of large-size pitch plates is realized with the next generation optical drive system equipped with the latest control device "D-CUBES" and the thermal displacement compensation system "Thermal Buster".

Workpiece	STEEL
Workpiece thickness	30mm(1.18")
Electrode material	Ø0.2(.008")BS
No. of cuts	5 times
machining time	7hr30min
Surface roughness	Rz1.8μm Ra0.22μm
Machining accuracy	±1.5μm

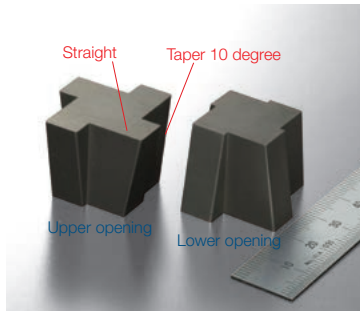


Machining Accuracy



Taper accuracy

- Taper accuracy of $\pm 0.01^\circ$ and dimensional accuracy of $\pm 5\mu\text{m}$ are realized.
- ODS provides high accuracy even when cutting tapered shapes.
- Taper accuracy is improved regardless of wire angle direction using Angle Master ADVANCE II.

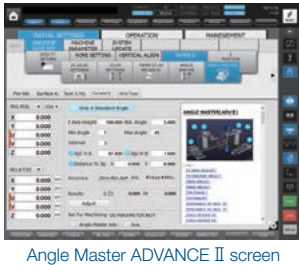


Wire electrode: $\varnothing 0.2(.008'')/BS$
Workpiece: Steel (SKD11) t20mm(0.79")



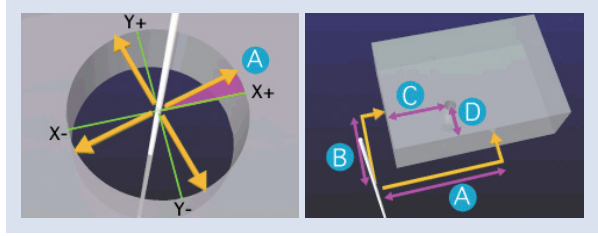
Angle Master ADVANCE II (option)

- Taper angle accuracy is more consistent in all taper directions.



Highly accurate pick-up function

- Workpiece pick-up positioning error is reduced.



Machining accuracy of thick workpiece

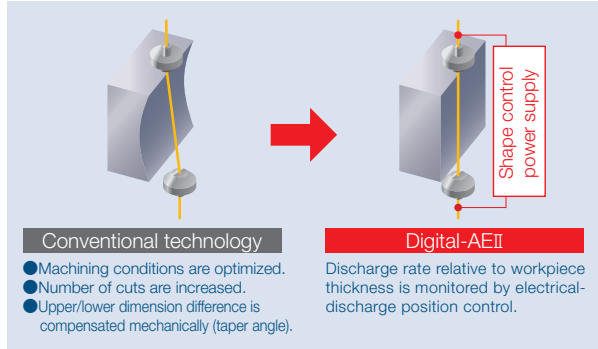
- Straightness of $\pm 1.5\mu\text{m} (.00006'')$ is possible even with a 100mm (3.94") thick workpiece.
- High-accurate straightness is realized by shape control power supply (Digital-AEII power supply).
- Surface roughness of $Rz0.8\mu\text{m}/Ra0.1\mu\text{m}$ is realized using Super-DFS power supply.



Wire electrode: $\varnothing 0.2(.008'')/MEGA$ TypeA
Workpiece: Steel (SKD11) t100mm(3.94")
Surface roughness: $Rz0.8\mu\text{m} / Ra0.10\mu\text{m}$

Shape control power supply (Digital-AEII)

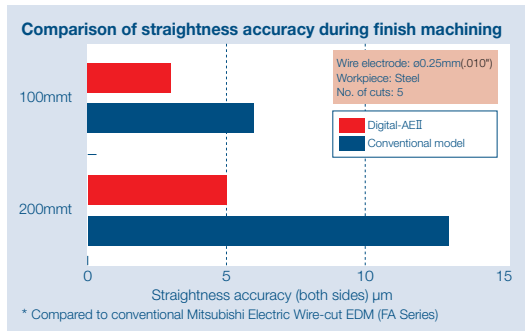
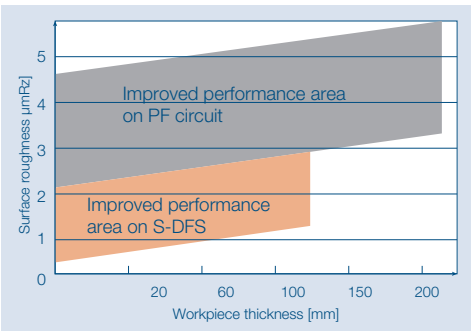
- Wire straightness is digitally controlled with electrical-discharge position control.
- Straightness accuracy is improved during rough, intermediate and finishing processes.



Finishing

Super-DFS power supply (standard)

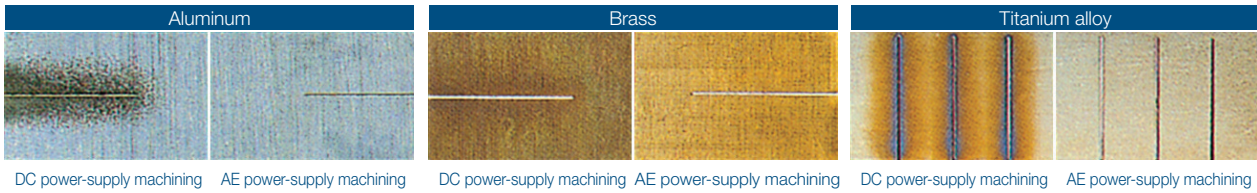
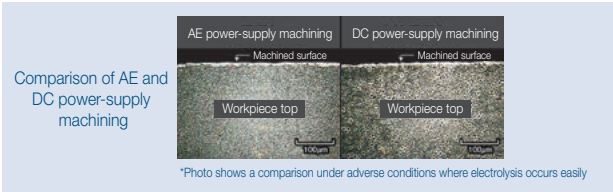
- Realize surface roughness of $Rz0.6\mu\text{m}/Ra0.08\mu\text{m}$. (steel)
- Machining with the workpiece set directly on the table. (insulation jig not required)
- Machining range not limited. (entire XY stroke area)



Machining Control

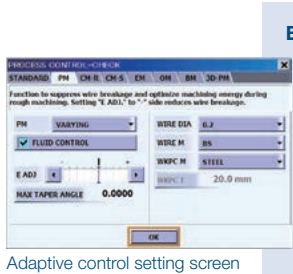
High-speed anti-electrolysis power supply (AE power supply)

- Electrolytic corrosion is suppressed, preventing the formation of soft layers.
- Compatible with all power circuits, from rough machining to finish machining.
- High-speed, safe unmanned machining possible using water.

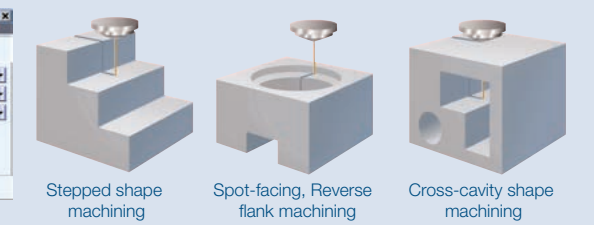


Fully-automatic rough machining control (PM control: Power Master)

- No need to set machining conditions or have knowledge of EDM machining.
- Automatically recognizes machining conditions and makes adjustment for the optimum machining condition.

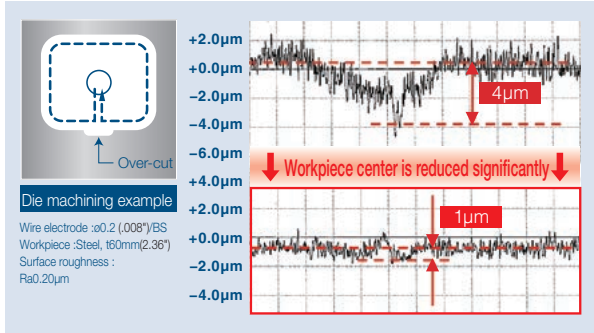


Examples of PM machining applications



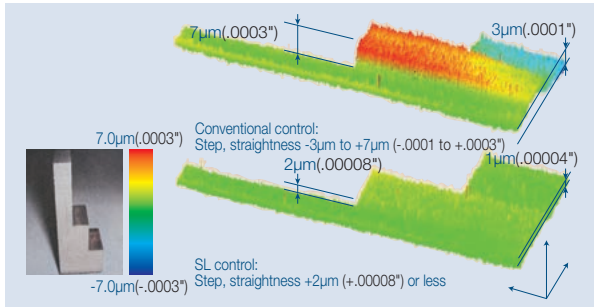
Over-cut (dimple) reduction control (EM control: Entrance Master)

- The dent of approach point is reduced at thick workpiece.
- Allows shape adjustment from convex to concave.



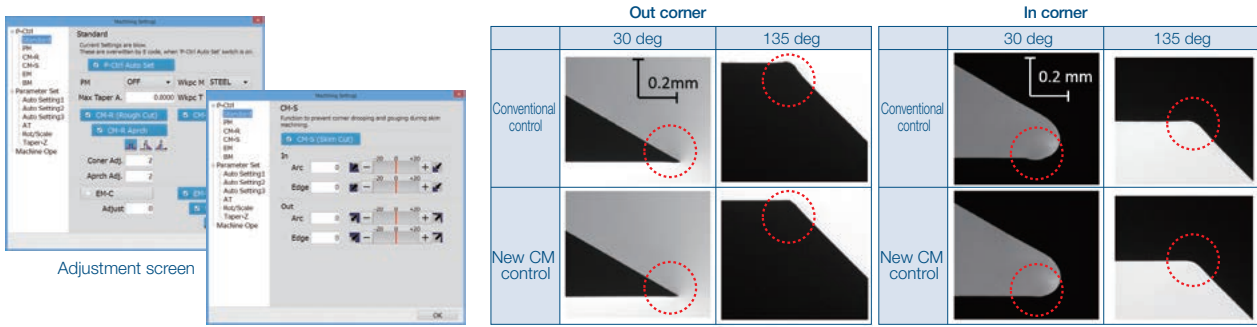
Machining surface step/straightness control (SL control: Stepless control)

- Greatly improves the step finish and wall straightness for workpieces with varying thicknesses.
- Highly accurate finishing of complicated parts.



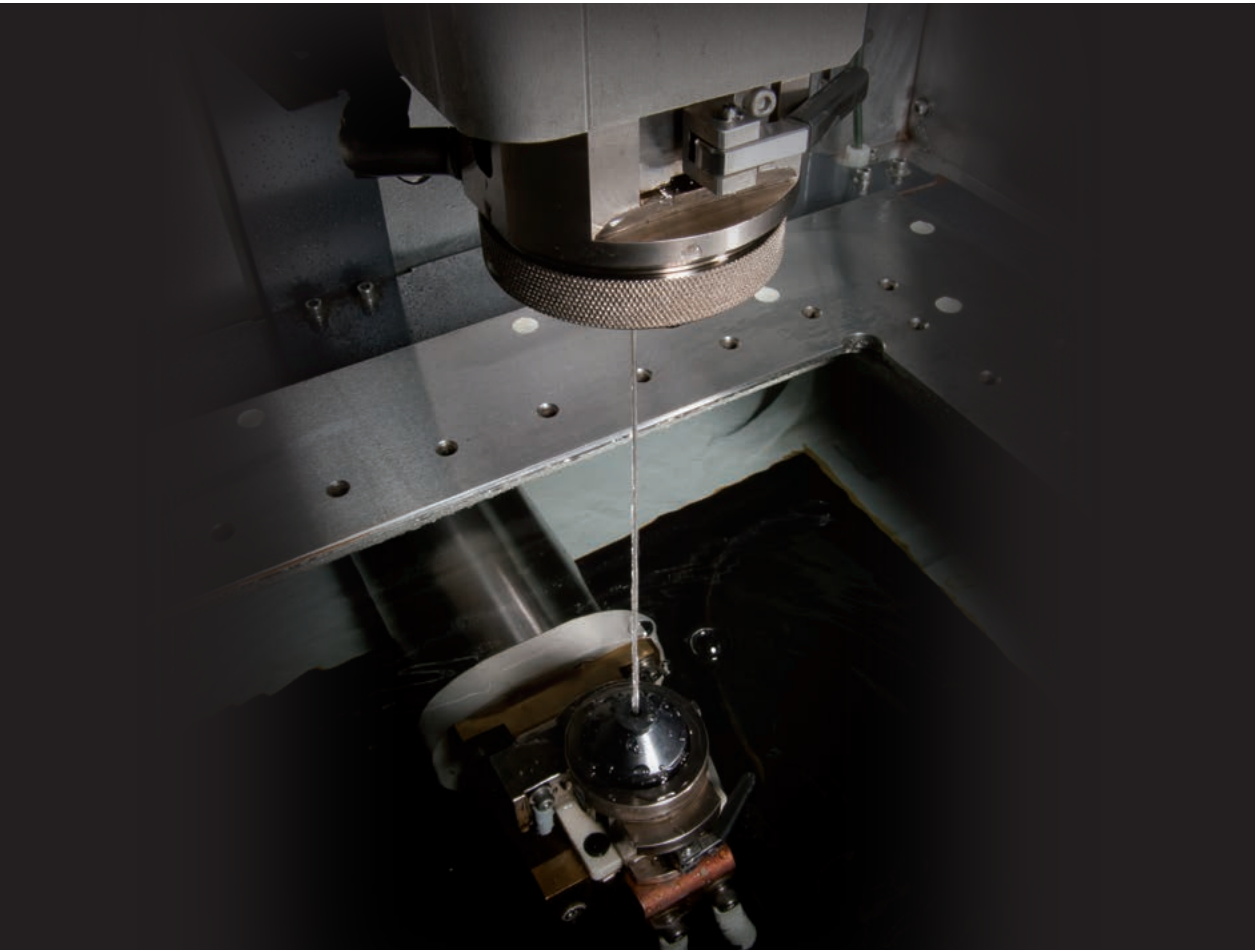
Enhanced corner machining control (CM control)

- Significant improvement in-corner accuracy by the combination of the updated corner control and new machining servo "D-CUBES NL control".
- Corner control adjustments have been simplified, leading to high-accuracy machining compared to conventional controls.



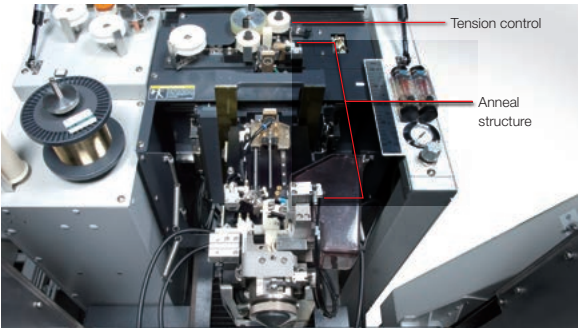
Automatic Wire Threading

Advanced technology for greatly improved productivity



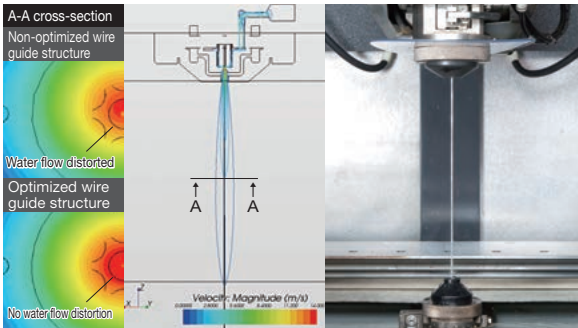
Wire electrode annealing structure

- Improved wire annealing power supply and tension control enhance wire threading (producing a curl ratio up to 10% *), which straightens the natural curl caused by spooling.
 - The greatly lengthened distance of annealed wire improves automatic wire threading for thick workpieces.
- * A curl ratio up to 3% applied for the conventional model (FA Series).



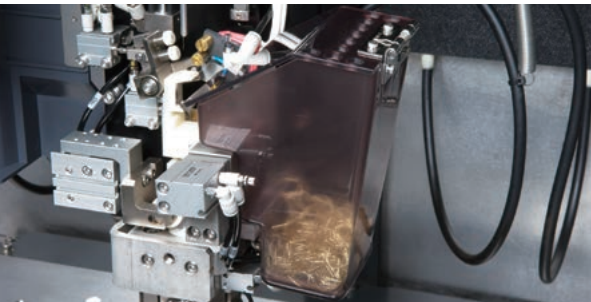
Jet mechanism

- Flow analysis simulation has been used to optimize the water flow mechanism for straightening the jet, which improves wire threading for thick workpieces.
- Stable wire automatic threading even at Z300 mm.



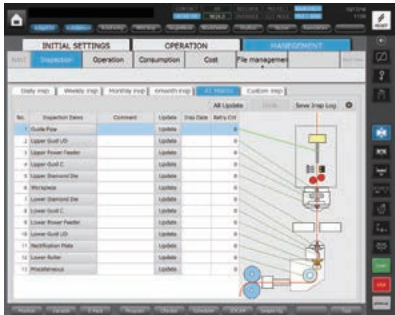
Wire collection unit

- Broken wire collection, which clears the upper guide after a wire break, has been improved so it handles even highly curled wire.



Maintenance management

- The AT maintenance screen displays each section of the AT unit and records any miss-feed locations. This quick reference makes it easy to maintain the effected area.

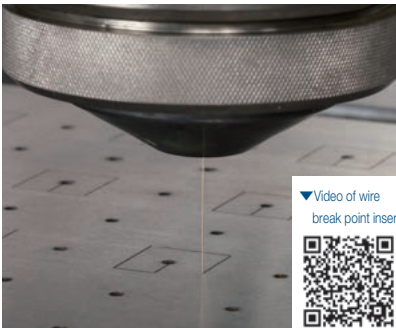


Improved automatic wire threading

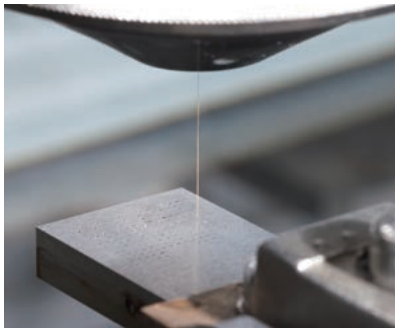
- New annealing system greatly improves wire threading with a curl ratio up to 10%
- Wire break point insertion is greatly improved for thick workpieces
- Suitable wire threading can be set for workpiece shape (jet on, jet off and submerged break point insertion)
- Automatic threading time is reduced by up to 35% when using AT high-speed mode (one insertion cycle includes one cut and insertion process)



Submerged automatic wire threading/re-threading drastically reduces total machining time of multiple level workpieces.



Wire break point insertion is possible



Automatic threading with 0.05 wire electrode into a 0.2 start hole

One-touch lever clamp mechanism

- New one-touch lever clamping system provides quick, easy and accurate power feed indexing.
- The clamp lever accurately locates the power feeder with repeatable torque, unlike systems that use the set-screw method.



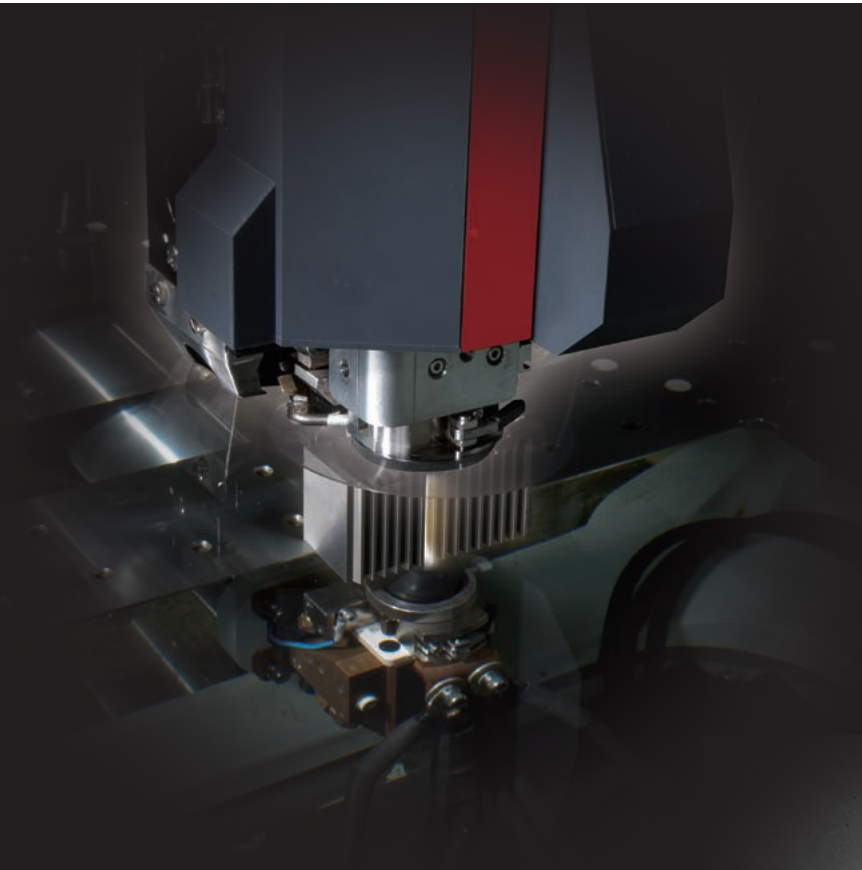
Diamond guide

- A round diamond guide is used to provide the best accuracy for both straight and taper cutting applications.
- Both upper and lower guides can be replaced by simply unscrewing the flush cups.



Productivity

Advanced Productivity



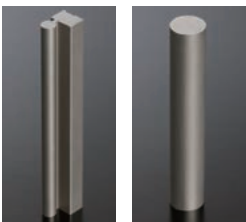
High-speed machining is enhanced by improved power supply for fine finish

Machining time comparison for Rz1.2μm/Ra0.15μm

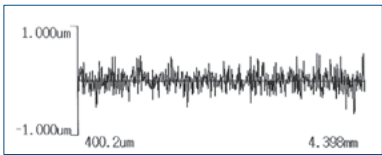


* Compared to conventional Mitsubishi Electric Wire-cut EDM (NA Series)

Machining samples



Surface roughness



Wire electrode : ø0.2(.008")/BS
Workpiece : Steel(SDK11), t60mm(2.4")

Rz0.6μm tungsten carbide finish

- Ultrafine surface by MP Water Technology can be replaced from oil-dielectric fluid wire-cut EDM.
- Maching speed is up to 30% faster than conventional oil-dielectric fluid wire-cut EDM with the higher productivity characteristic of water fluid.

MP Water Technology

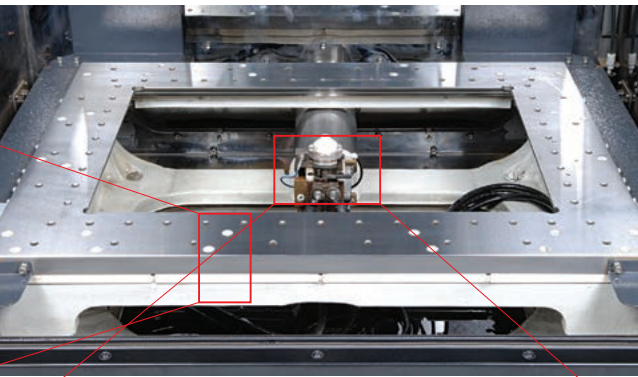
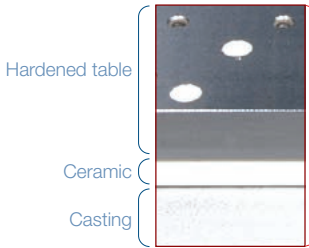
Up to 30% Faster

Conventional(Oil)

Machining speed
Ø0.20 (.008") BS Wire, Tungsten carbide/thickness 60mm(2.36")

Table insulation

- Insulated worktable ensures improved surface finishing.
- Stable machining realized when using short-pulse and low-voltage machining conditions.



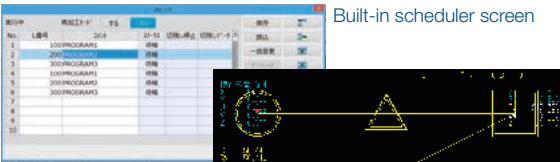
Lower flat cable

- Flat cables are used to minimize pressure to the lower arm.
- Reduced pressure to the lower arm makes high-accuracy machining possible regardless of machining position.

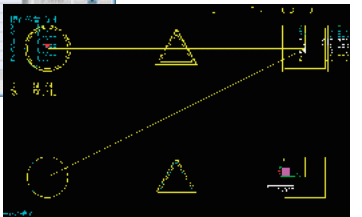


Built-in scheduler

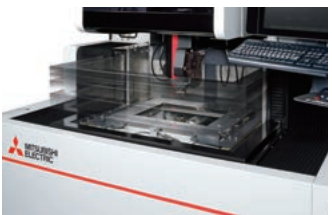
- Built-in scheduler Non-stop machining, at night or on the weekend, in combination with automatic wire threading that has reputable performance.
- The height of the machining tank adjusts automatically and can deal with materials of different heights. (OverFlow mode)



Built-in scheduler screen



Built-in CAD screen

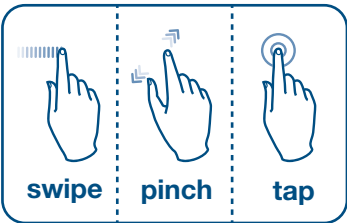


Automatic elevation tank

Operability

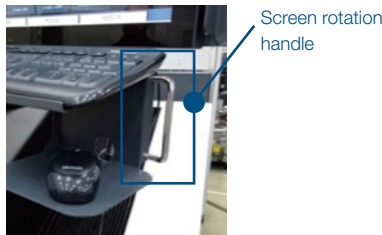
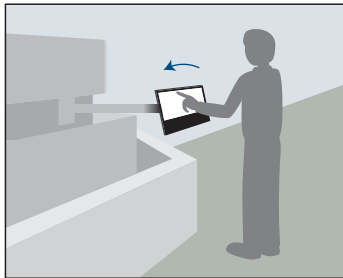
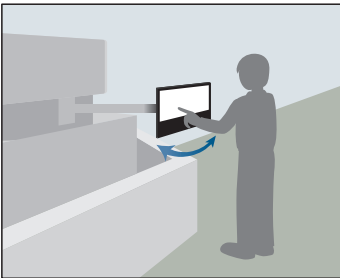
Control unit

- Information is displayed on a new large 19-inch touch screen
- Keyboard and mouse are standard
- Intuitive operation is performed by gestures from a multi-touch supporting panel



Screen tilt mechanism

- The new tilt mounting system allows adjustability to fit operators of varying heights.



Screen rotation handle

Thin liquid-crystal hand-held pendant box

- The new design of the thin liquid crystal manual pendant box improves workpiece setup and saves time.
- The hand-held operation box is equipped with a LED flash light mounted on the back.



PRG. POS.	POSIT.	ALARM
CONTACT		EDGE
X	300.0000	
Y	-200.0000	
Z	-150.0000	
OVERRIDE		100%
DOOR	BACK	

● Magnified view of coordinates

PRG. POS.	POSIT.	ALARM
CONTACT		EDGE
X	300.0000	100%
Y	-200.0000	G54
Z	-150.0000	
SET UP		
Z LIMIT	POS. SELECT	SET ZERO
CENTER POS.	EDGE POS.	MID PT. POS.
DOOR	1/2	

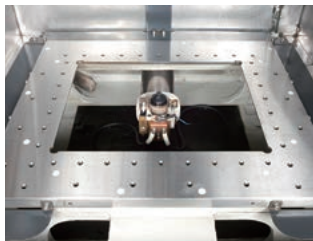
● Various setup functions
● Screen customization

PRG. POS.	POSIT.	ALARM
CONTACT		EDGE
X	300.0000	POS SELECT
Y	-200.0000	W00
Z	-150.0000	
SET ZERO		
DOOR	BACK	

● Teaching function

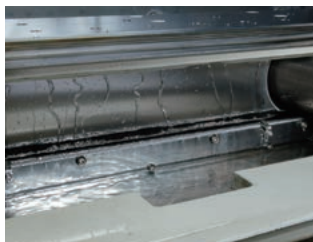
Hardened table and all stainless steel structure

- Equipped with a hardened table
- The working tank and dielectric supply unit are made of stainless steel
- Resistant to deterioration by dielectric fluid and sludge



Cleaning mechanism<2400, 4800 type>

- A forced-flush self-cleaning mechanism prevents sludge from sticking to the stainless-steel seal plate



Wire alignment

- Highly accurate wire alignment is easy using the wire-alignment device (option)
- Taper parameter set-up is simple using the wire-alignment device



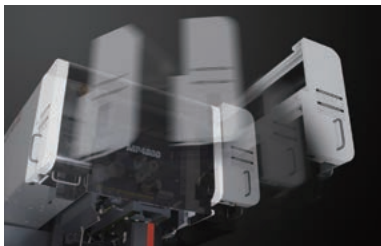
High-accuracy edge positioning

- Highly accurate workpiece edge positioning is possible with water flow on or when the workpiece is submerged.
- The edge positioning tolerance can be adjusted to match workpiece accuracy requirements.
- Wire electrode consumption is reduced up to 70% during edge positioning. (wire must be 0.1mm or larger)



Storable top cover (only MP4800)

- The top cover that swings open and gets stored side, allowing the easy workpiece bringing into the machine.



Dielectric fluid flow meter and jet flow adjustment valve

- Dielectric flow meters are easy to read.
- The adjustable jet flow valve increases the range of work that can be done.



Chiller unit filter

- Located easy cleaning.



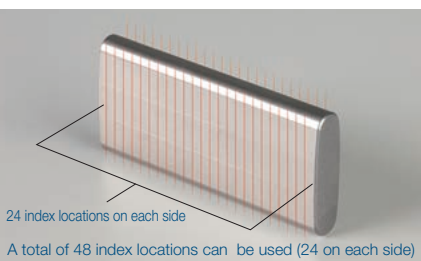
Jet cleaning nozzle

- The convenient location of the jet cleaning nozzle makes tank cleanup easy.



Flat power feed terminal

- The flat shape makes it easy to index to the next location.



Broken wire collection box

- Conveniently located at the front for easy maintenance.



Operability



"Fast" and "Ergonomic" operation

Excellent performance with "Easy operation", "human error reduction" and "connect ability" supporting productivity improvement for customers.

Operation

Pre-machining preparation

Daily inspection and wire/workpiece mounting
Maintenance inspection tools

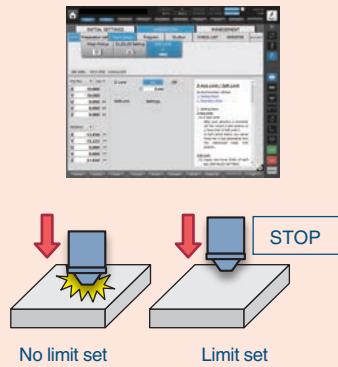
- The maintenance manual as well as maintenance history are supported.
- Reduction in machine down time from insufficient maintenance.



Workpiece setup

Reference positioning, Z paramater (Z1, Z2, Z5) setting
Z-axis limit setting

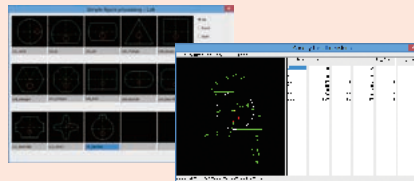
- The Z-axis limit can be set easily after mounting the workpiece.
- Collisions caused by erroneous operations are prevented.



Program

Simple creation of machining program
Standard shape library

- Simple standard shapes can be easily programmed by entering a few key dimensions into variables.



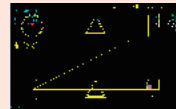
Consumables check

- The remaining amount of consumables is checked in accordance with the machining estimate.
- It prevents a machine stop caused by insufficient consumables, such as an empty wire spool.



Built-in 2D CAD / CAM

- Complex shape can be programmed with built-in CAD / CAM.
- Program can be created by reading data such as DXF data.



Machining condition search function

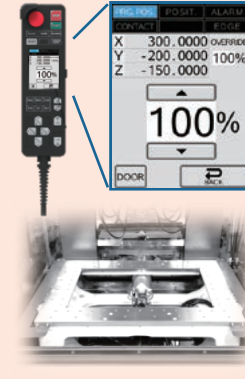
- In addition to thickness, material, surface roughness wire diameter, line type, manufacturer can be selected.



Dry run

Programs can be checked for possible interference.
Override

- The dry run speed can be set at the pendant box to shorten the required run time.



Check list

All necessary operations to be performed before machining can be checked
Check list

- The pre machining checklist is displayed.
- The machine cannot be started if any checklist item has been skipped.
- Errors by operators who are not accustomed to using the machine are prevented.



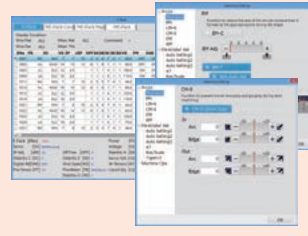
Monitoring machining

The start of machining and the machining status can be checked
Resuming machining

- A machining task that has been aborted by resetting the machine can be selected from the list and resumed.

Automatic setting of adaptive control

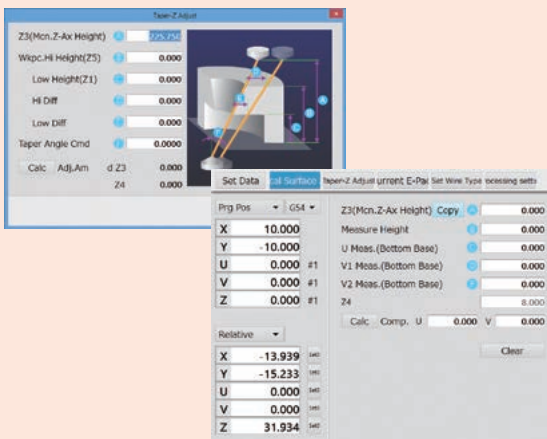
- Our EDM knowhow is used to optimize machining through automatic control settings.



Initial setting

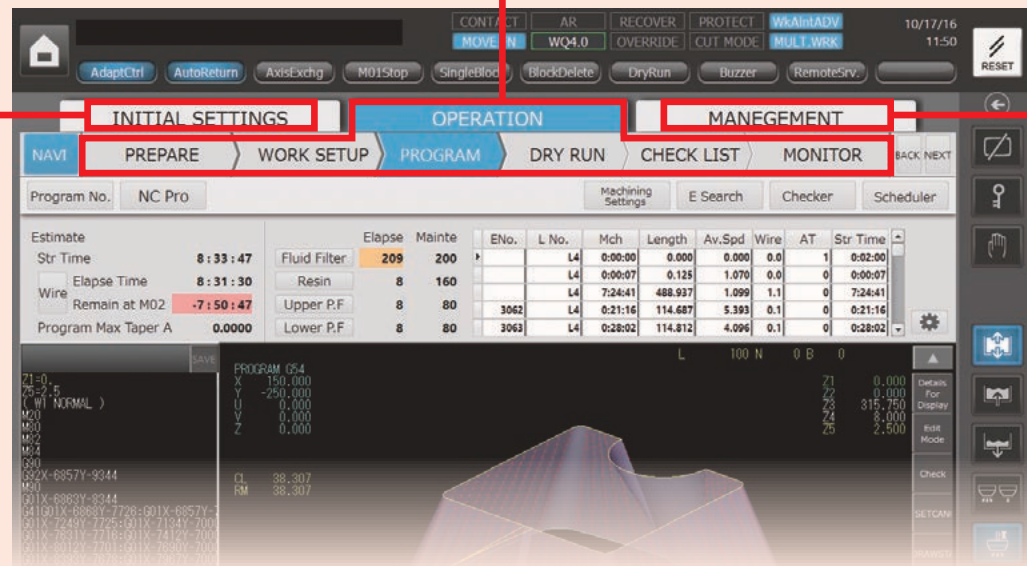
The items that do not change during the daily operation are set.
Calculation tool (vertical correction and taper function adjustment)

- Even calculations specific to the machine can be performed only by entering the measurement results, and do not require any manual calculations.
- Reduces operator's labor and also errors by operation setting.



Main menu

To enable the necessary information to be set and referred at the required time, aggregated on three screens.
This enables easy usage of information by anyone without being getting confused by operating procedures and operation methods.

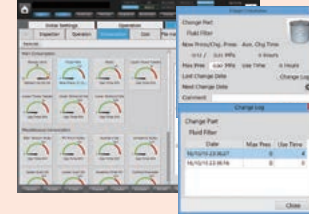


Machine log management

The operation event log, inspection and maintenance log, consumables, and cost can be managed

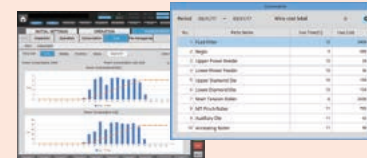
Consumables management

- The consumables screen manages usage time and replacement log of all consumables.



Operating cost

- The operating cost can be viewed on the cost management screen. This is useful for budget planning.

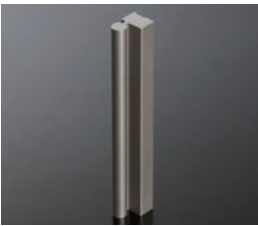
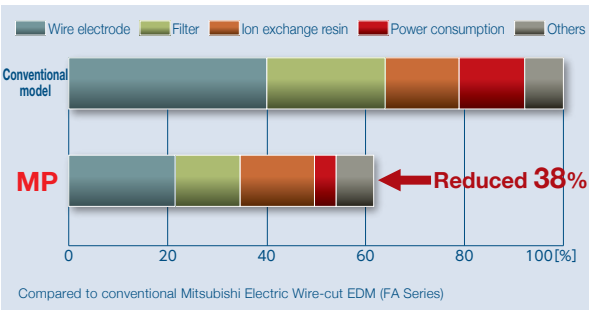


Energy Savings, Low Operating Cost



Running cost

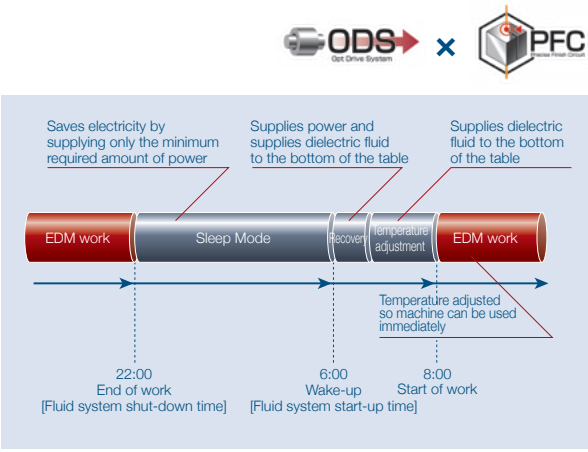
- Total running cost reduced up to 38%, which is accounted for 90% by filter, ion exchange resin and power consumption



Wire electrode : $\phi 0.2(.008)$ "/BS
Workpiece : Steel(SKD11), t60mm(2.4")
Surface roughness : Rz3.5 μ m/Ra0.45 μ m/18 μ "Ra

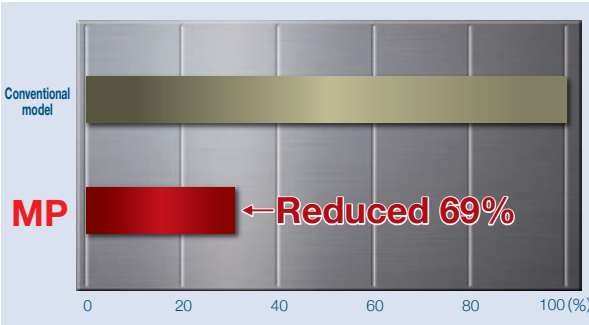
New energy-saving mode (Sleep Mode)

- The new energy-saving mode can be scheduled according to the current job ending time and start time the next day
- In Sleep Mode, the amount of energy consumed is greatly reduced as the result of using an automated pump-shut-off system
- Once the scheduled start time is reached, the system restarts the fluid system thermally, stabilizing the machine for work the next day



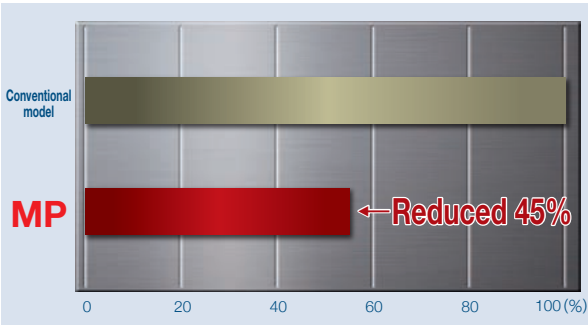
Power consumption reduced up to 69%

Power consumption reduced by ODS



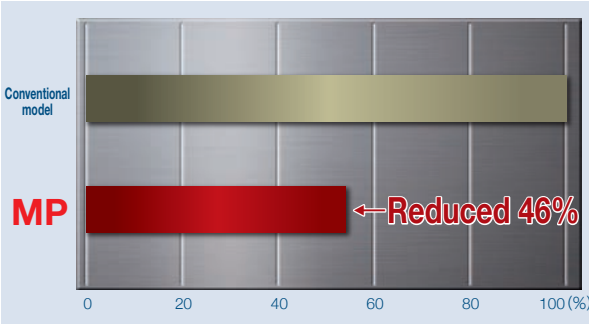
Filter cost reduced up to 45%

- Filter cost is reduced by changing the filtration flow rate between the rough cut and finishing processes



Wire consumption reduced up to 46%

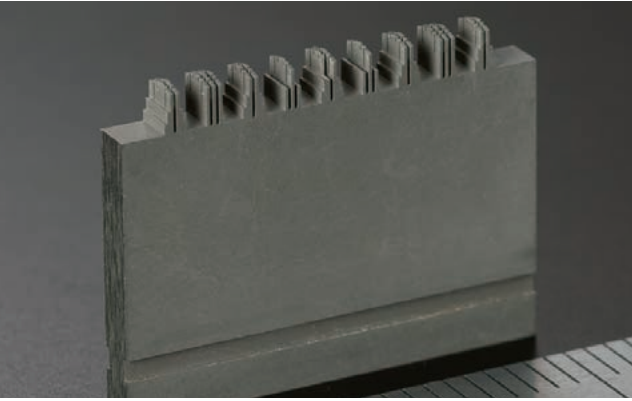
Increased power-supply efficiency reduces the wear on the wire allowing the wire spooling rate to be reduced by PFC



*Compared to conventional Mitsubishi Electric Wire-cut EDM (FA Series), compared to the same machining amounts

Other Functions

$\phi 0.05(.002)$, $\phi 0.07(.003)$ automatic wire threading (option: MP1200/MP2400)



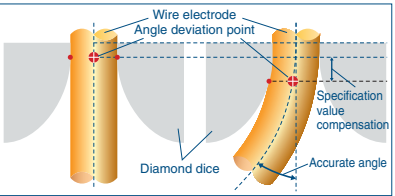
Wire electrode : $\phi 0.05(.002)$ "/SP
Workpiece : Steel(PD613),
Length 20mm(.79") width 2mm(.08")

- Improved design reduces maintenance
- Various machining shape, it is equipped with the machining conditions that can correspond to the machining state, can accommodate a wide range of applications.

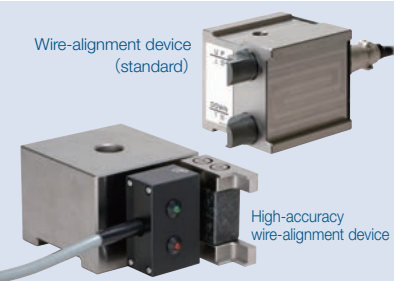
Angle Master ADVANCE II (option)

High-accuracy taper machining using round dies

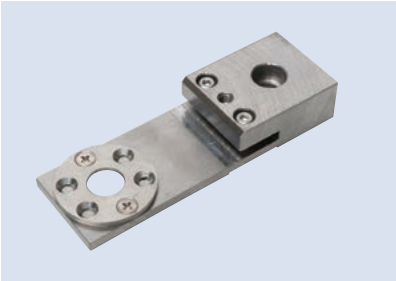
- Highly accurate machining of extremely small tapered sections is possible.
- Uniform die edge land cuts are possible.
- Angle Master Function realizes highly accurate machining of large tapered sections.



Options



High-accuracy wire-alignment device / wire-alignment device
This device aligns the wire electrode with the table



Angle Master ADVANCE II (jig)
This device aligns the wire electrode with the table



Angle Master ADVANCE II guide kit
Max. 45° tapered machining possible using dedicated diamond guide



20/25kg wire spool unit
Long-time continuous machining is possible



Wire processing unit
The wire is chopped after the collection roller



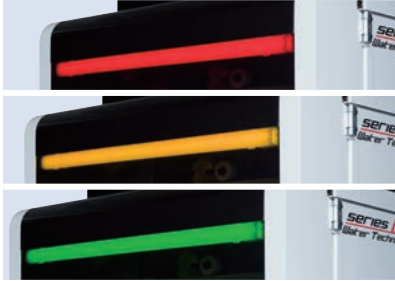
4-piece filter system
4-piece filter specifications reduce filter replacement frequency



Run timer
Indicates accumulated machining time



Warning light



Built-in warning light

Standard



Workpiece clamp set
Clamp jigs dedicated for use in holding workpieces



Tools (tool box)

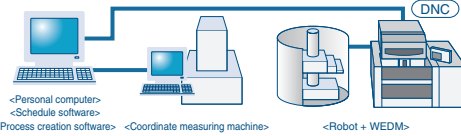
Specifications differ according to country and region; please contact a Mitsubishi Electric representative for details. ◎: Standard equipment ○: Can be retrofitted ●: Factory installation only ×: Not available

Option name		MP1200	MP2400	MP4800
Machine unit	UV OPT-drive system specifications	◎	◎	◎
	φ0.05 (.002"), φ0.07 (.003") automatic wire threading *1	●	●	×
	High precision Narrow slit specification *2	○	○	×
	Wire processing unit *3	○	○	○
	20/25kg (44.1/55.2lb) wire spool unit	○	○	○
	Temperature monitoring function	●	●	●
Power supply	Dynamic thermal protection (DTPro)	×	×	○
	Ultrafine finish power supply (Super-DFS power supply)	◎	◎	◎
Dielectric fluid system	H-FS power supply	◎	◎	◎
	4-piece filter system	○	○	○
	Filter pressure sensor	◎	◎	◎
Communications	Filter automatic switching *4	●	●	●
	External signal output *9	○	○	○
	LAN/W *5	◎	◎	◎
	DNC (FTP) (S/W)	◎	◎	◎
Taper Machining	Built-in scheduler	◎	◎	◎
	Angle Master ADVANCE II set *6	○	○	○
	Angle Master ADVANCE II guide kit φ0.2 (.008") (±30°,±45°) *7	○	○	○
	Angle Master ADVANCE II guide kit φ0.25 (.010") (±30°,±45°) *7	○	○	○
Software	Anti-virus protection	◎	◎	◎
	Sleep mode	○	○	○
	COREHOLD	○	○	○
	3D Data import	○	○	○
Display	Optionbox *8	○	○	○
	Warning light *9	○	○	○
	Built-in warning light *9	○	○	○
	Run timer *9	○	○	○
Others	Manual (e-manual)	◎	◎	◎
	Manual (Booklet)	○	○	○
	LED light	○	○	○
	Wire-alignment device / High-accuracy wire-alignment device	◎/○	◎/○	◎/○
	Tool box	◎	◎	◎
	Workpiece clamp set	◎	◎	◎

*1 : The φ0.05 (.002") to φ0.15 (.006") wire electrodes cannot be used with the wire processing unit.
A dedicated diamond guide is not included.
*2 : Parts for φ0.05 (.002"),φ0.07 (.003") are included with the φ0.05, 0.07 automatic wire threading specification.
*3 : Cannot be used with the φ0.05 (.002"), φ0.07 (.003") automatic wire threading.
*4 : 4-piece filter system is needed.
*5 : LAN cable should be all straight wiring type with shielding connector, category 5 (100BASE-TX compliant), STP (four shielded twist pair).
A switchable hub that can ground the shielded LAN cable should be used.
*6 : Dedicated devices for Anglemaster ADVANCE II (S/W), Anglemaster ADVANCE II diamond guide and rectifier nozzles are sold separately.
*7 : Standard diamond guide and nozzle (φ7(.28")) is used for taper machining of 15 degrees or less. Angle Master ADVANCE II guide kit (H/W) is needed for taper machining of 15 degrees or more (A wire electrode for taper machining should be used).
*8 : Necessary for mounting External signal output, Warning light, Built-in warning light and Run timer.
*9 : Option box is needed.

Wire-cut EDM automation system

- Accumulates workpiece measurement data
 - Compatible for external set-up using a coordinate measuring machine
 - Enables automatic measurement when measuring on an EDM
- Creates processes offline
- Automatically exchanges workpieces using a robot



* Please contact a Mitsubishi Electric representative for details.

Network connection specifications (DNC, FTP)

Data, such as NC programs, machining conditions and variables can be exchanged between a personal computer and EDM. The required options differ according to the models and purpose, and can be confirmed using the following table. One IP address must be prepared for each EDM within the user's in-house network.

Required specifications	Image drawing	Required option	Supplement
Operate on the EDM side and receive data from personal computer.		LAN/W (standard)	Use EDM's Explorer and receive data in the common HDD on the EDM side. After that, data I/O operations are required.
Operate on the EDM side and send data directly to the EDM's NC data area.		FTP (standard)	Data can be received only using data I/O operation.
Operate on the personal computer side and send data to the EDM.		LAN/W (standard)	The personal computer's Explorer and the EDM's common HDD are used. After that, data I/O operations are required for the EDM.
Operate on the personal computer side and send data directly to the EDM's NC data area.		DNC (standard)	Commercially available DNC software must be installed on the personal computer side. Refer to DNC specifications operation for details.
Automatically send data from machining machine to FTP server		Operating status data output	Customer should prepare FTP server

Power Supply, Control Specifications/Machine Installation

●Power supply/Control unit specifications

Compatible model		MP1200 / MP2400 / MP4800
Power supply unit specifications		
Power supply unit	Model	WMP (WMP48 : only MP4800)
	Power supply circuit	Regenerative transistor pulse type
	Cooling method	Completely sealed/Indirect cooling
	Anti-electrolytic power supply	All modes
	Maximum output current	50A
	Power supply mode	12 types : Anti-electrolysis power supply
	Machine voltage selection	19 types
	Machining setting	45 types
	OFF time	20 types
	Stabilization circuit A	10 types
	Stabilization circuit B	20 types
	Stabilization circuit C	7 types
	Stabilization circuit E	5 types
	FM circuit (LA, LC)	2 types
	PM control	3 notches (changeable with M code or screen) • Workpiece material: Steel, tungsten carbide, copper, aluminum • Applicable only for rough-cut conditions
	AVR	Built-in
Unit dimensions (mm) (in)	600 × 650 × 1767 (23.6 × 25.6 × 69.6)	
Unit weight (kg) (lb)	250 (551)	
Control unit specifications		
Control unit	Model	W41MP-2
	NC program input method	Keyboard, USB flash memory, Ethernet
	Pointing device	Touch panel, mouse
	Display	19" color TFT
	Display characters	Alphanumeric characters
	Control method	CNC closed loop
	Number of control axes	Max. 6 axes simultaneously
	Setting unit	X, Y, U, V, Z ... 1/0.1μm
	Minimum driving unit (mm) (in)	50nm (0.000050mm(0.000002"))
	Max. command value	±99999.999mm
	Position command format	Combined use of increment/absolute values
	Interpolation function	Linear, circular, and spiral
	Scale magnification	0.00001 ~ 99.999999 (G code) 0.001 ~ 9999.999 (S code)
	Optimum feed control	Automatic selection of machining speed according to gap voltage sensing
	Path-retrace control	Reverse path retrace during short-circuit
	Wire offset	±99999.999mm Offset numbers: 1 to 900 (intersection point calculation)
	Basic screen menu	3 types (Initial setting, operation, history management)
	Automatic 2nd cut	Interactive screen method
	Machining condition (E-pack) storage	1 to 6999
	Program number command	1 to 99999999
	Sub-program	Nesting level 30
	Sequence numbers	1 to 99999
	Manual input positioning	Input on screen
	Manual operation box	Thin liquid-crystal type with LED flash light
	Graphics	XY plane, XY-XZ plane, solid, table scaling, 3D model display, background drawing, automatic machining path drawing
	User memory capacity	1GB
	Maintenance function	Management of consumable parts (time display)
	Adaptive control	SL, CM, EM, PM, BM
External dimensions (mm) (in)	518 × 97 × 363 (20.3 × 3.8 × 14.3) (Excluding keyboard and mouse pad)	
Weight (kg) (lb)	15 (33)	

Machine installation checklist

Determining the machining details

Check each item, and make sure that no item or order is overlooked.

1) Determine the workpiece	
2) Determine the machining site	
3) Determine the pre-processing site	
4) Determine the post-processing site	

Preparation of installation fixtures

1) Plan the installation fixtures	
2) Prepare or manufacture the fixtures	

Preparation of consumable parts

1) Purchase consumable parts such as wire electrodes	
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Training of programmers and operators

1) Select the programmers and operators	
2) Apply for training seminars	

Confirmation of foundation and power-supply work

If there is any possibility of radio disturbance, investigate it prior to starting work.

1) Confirmation of floor area	
2) Confirmation of environment (constant-temperature dust-proof room, measure for radio disturbance, prevention of external noise)	
3) Confirmation of foundation floor	
4) Foundation work	
5) Primary wiring for power lead-in	
6) Grounding work	
7) Construction of dielectric fluid (city water) supply/drainage facilities	
8) Air piping work	

Confirmation of delivery path

Check the path inside and outside the factory to avoid any trouble during delivery.

1) Traffic restrictions to factory	
Road width	
Entry road	
2) Factory entrance and width of gate in factory	(m)
Factory building entrance dimensions (height × width)	(m)
3) Constant-temperature dust-proof room entrance dimensions (height × width)	(m)

Cautions

The standard delivery entrance dimensions for standard shipment delivery are given on the product lineup page. If the entrance is smaller than the standard delivery entrance, a machine with different dimensions can be shipped. * Please contact a Mitsubishi Electric representative for details (a separate estimate will be issued). Note that delivery may not be possible in some cases depending on the dimensions.

Installation conditions

1. Installation site

- ①Constant-temperature dust-proof room
 - Recommended room temperature 20±1°C (68°F±2)
 - Usable temperature range 5 to 35°C (41°F to 95°F)
 - Temperature fluctuation will directly affect machine accuracy. To maintain performance accuracy, select a place with minimal temperature fluctuation.
- Install the EDM in a constant-temperature room when performing high precision machining, even when using skim cuts.
- Note that an environment where the temperature fluctuates by 3°C (5°F) or more within 24 hours, or 1°C (2°F) or more within one hour can adversely affect machining accuracy. Make sure that the machine body is not subject to direct wind from air-conditioners or to direct sunlight.
- Dust-free location is recommended.
- Install a wire-cut EDM in an environment with no corrosive gases, such as acid or salt, or mist, and with low levels of dust.
- Grinding dust can adversely affect the machine's linear scales and ball screws. Pay special attention to installation location to avoid this hazard (separate from grinding machine, or install in separate room, etc.).
- Humidity Within 30 to 75%RH (with no dew condensation).
- Temperature range during transportation and storage
 - 25 to 55°C (-13°F to 131°F) (when power is not connected).
- ②Tolerable vibration of floor
 - Select a floor where vibration or impact will not be conveyed.
 - As a reference, the vibration level should have a max. amplitude of 2μm or less at a 10 to 20Hz frequency.
 - Consult with the contractor or vibration measuring instrument manufacturer for details on the measuring method.
- ③Foundation
 - The floor should be concrete with a thickness of 400mm (15.7") or more so it can sufficiently withstand the system's weight.
 - The floor inclination (step) must be within 6/1000 (floor inclination 6mm per 1m) (MP2400 Series).

2. Machining heating value

Use the equipment capacity to calculate the wire-cut EDM's heating value required for designing a constant-temperature room.

Heating value (kW) = Equipment capacity (kVA) × 0.6
= 13.5kVA × 0.6
= 8.1kW

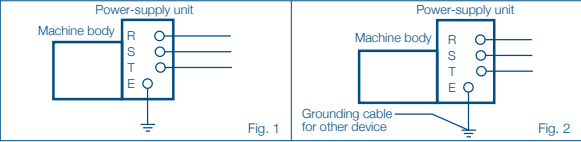
The above value is a guideline. Consult with the constant-temperature room manufacturer for details.

3. Power-supply equipment

- Primary wiring 3-phase 200/220VAC±10% 60Hz, 3-phase 200VAC±10% 50Hz
 - Power capacity 10.0kVA (during normal use) (when using ø0.2(.008")mm wire electrode) 13.5kVA (when using the maximum)
- * Use a 14mm² or thicker cable for the primary connection.

4. Grounding work

- Wire-cut EDMs must always be grounded to prevent external noise, radio disturbance and earth leakage.
- Install a wire-cut EDM in an environment with no corrosive gases, such as acid or salt, or mist, and with low levels of dust.
- Common grounding can be used if noise from other devices will not enter through the common grounding; the grounding cable must be connected independently to the grounding location (Fig. 2).
- Use a 14mm² grounding wire.

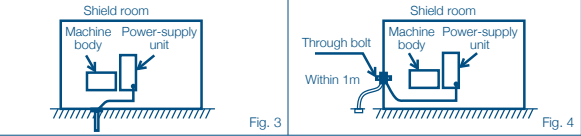


5. Primary air equipment

- Hose diameter : 1/4 hose (hose sleeve outer diameter: ø9.0 (0.35"))
- Pressure : 0.5 to 0.7MPa (72.5 to 101.5psi)
- Flow rate : 75ℓ/min or more (2.65cu.ft./min.)
- Air (compressed air) is used to operate the automatic wire feeder and work tank door, etc. Air supplied from a normal compressor contains various impurities that could cause operation faults if they get into the pneumatic devices such as the solenoid valve. Install an air filter with a drainage discharge mechanism, etc., in the air source (primary source) piping to prevent impurities from entering the pneumatic devices.

6. Shield room

- Install a shield room if a wire-cut EDM affects televisions or other communication facilities in the area. Observe the following points when installing the wire-cut EDM in the shield room.
- 1. Ground the wire-cut EDM in the shield room (Fig. 3).
- 2. If the wire-cut EDM cannot be grounded in the shield room, connect the wire-cut EDM's grounding cable to the shield room's grounding terminal (through bolt) as shown in Fig. 4.
- 3. Consult with a Mitsubishi Electric representative for details on installing a shield room.



Precautions for selecting earth-leakage breaker

To prevent malfunctions caused by the external noise from control units, etc., a filter is installed for the power-supply input. By grounding one end of this filter, an earth-leakage current of approx. 30 to 40mA passes through the filter. A highly sensitive earth-leakage breaker (sensitivity current 30mA) could malfunction. Thus, a medium-sensitivity earth-leakage breaker (sensitivity current 100 to 200mA) is recommended for the wire-cut EDM. Class C grounding (grounding resistance of 10Ω or less) is recommended for the wire-cut EDM. Even if the sensitivity current is 200mA, the contact voltage will be 2V or less, and no problems will occur in preventing electric shock (application of tolerable contact current Class 2, 25V or less).

Refrigerant for dielectric fluid chiller

The dielectric fluid chiller unit includes a fluorinated greenhouse gas R410A. Please use only the specified refrigerant (R410A), when servicing the dielectric fluid chiller unit. The use of any refrigerant other than that specified will cause mechanical failure, system malfunction or unit breakdown. In the worst case, this could lead to a serious impediment to securing product safety.

Disposal

The dielectric fluid, dielectric fluid filter, ion exchange resin, wire, etc., are industrial waste. These must be disposed of following national and local laws and ordinances.

Harmonic distortion

If there is harmonic distortion in the power supply, the machine operation could be affected even if the voltage does not fluctuate. In addition, the harmonic current could flow from the wire-cut EDM to the power system and adversely affect peripheral devices. If the effect of the harmonic distortion causes problems, install a harmonic suppression filter or take other measures.

Wire electrodes

Use the following wire electrodes

OB-PN (ø0.1/BS - ø0.3/BS)	OkI Electric Cable
HBZ-U(N) (ø0.1/BS - ø0.3/BS)	Hitachi Metals
SBS-HN (ø0.1/BS - ø0.3/BS)	Sumiden Fine Conductors
SWP-SP (ø0.05/SP - ø0.07/SP)	Nippon Steel & Sumikin Wire

*The wire electrodes shown above do not guarantee performance

Recommended sliding surface lubricants

Use one of the following lubricants for sliding surface As of November 2018

Manufacturer	Product name
Exxon Mobil	Mobil DTE26
Idemitsu Kosan	Super Hydro 68A
Showa Shell	Terrace Oil 68
JX Nippon Oil & Energy Corporation	Super Mulpas DX68

Terms of warranty

1.Terms of warranty

This will differ according to country and region of sale; please contact a Mitsubishi Electric representative for details.

2.Coverage

- (1)Terms of repairment free of charge
- Parts labor and travel are included free of charge when the failure occurs during normal use for the stated Terms of the warranty (based on proper usage and maintenance as described in the operations manual and sales agreement).
- Coverage exceptions:
 - ①When a failure occurs that was caused by a machine modification that directly affects the machine's functioning or accuracy.
 - ②When a failure occurs caused by the use of non-standard parts, consumables or lubricants.
 - ③When a failure occurs caused by a natural disaster such as lightning, earthquake or storms and flooding.
 - ④When the use of non-recommended consumables or aftermarket parts are used such as filters or flushing nozzles.
- (2)Exclusion of loss in opportunity and secondary loss from warranty liability
- Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation to:
 - ①Damages caused by any cause found not to be the responsibility of Mitsubishi.
 - ②Loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products.
 - ③Special damages and secondary damages whether foreseeable or not, compensation for accidents, and compensation for damages to products other than Mitsubishi products.
 - ④Replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.
- (3)Information regarding what should be revised or improved acquired during product support may be used to improve product quality or services.

3.Post Warranty / Expected Service Life

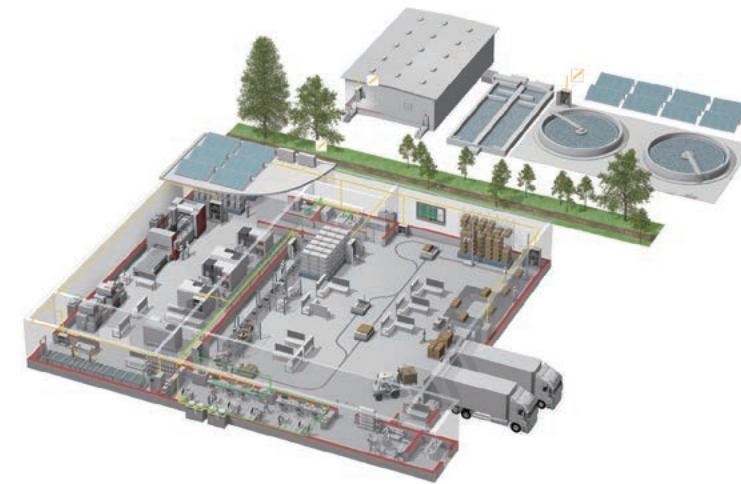
After the warranty period expires, all standard service rates and travel expenses will apply. Normal service life expectancy is 11 years after installation, but there may be some cases where discontinued electrical parts such as semiconductors and motors will reduce this period.

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Mitsubishi Electric offers a wide range of automation equipment from PLCs and HMIs to CNC and EDM machines.

A NAME TO TRUST

Since its beginnings in 1870, some 45 companies use the Mitsubishi name, covering a spectrum of finance, commerce and industry.

The Mitsubishi brand name is recognized around the world as a symbol of premium quality.

Mitsubishi Electric Corporation is active in space development, transportation, semi-conductors, energy systems, communications and information processing, audio visual equipment and home electronics, building and energy management and automation systems, and has 237 factories and laboratories worldwide in over 121 countries.

This is why you can rely on Mitsubishi Electric automation solution - because we know first hand about the need for reliable, efficient, easy-to-use automation and control in our own factories.

As one of the world's leading companies with a global turnover of over 4 trillion Yen (over \$40 billion), employing over 100,000 people, Mitsubishi Electric has the resource and the commitment to deliver the ultimate in service and support as well as the best products.



Low voltage: MCCB, MCB, ACB



Medium voltage: VCB, VCC



Power monitoring, energy management



Compact and Modular Controllers



Inverters, Servos and Motors



Visualisation: HMIs



Numerical Control (NC)



Robots: SCARA, Articulated arm



Processing machines: EDM, Lasers, IDS



Transformers, Air conditioning, Photovoltaic systems

* Not all products are available in all countries.