

FACTORY AUTOMATION

Wire-cut EDM Systems MP series





Series MP Water Technology





GLOBAL IMPACT OF MITSUBISHI ELECTRIC



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

Changes for the Better

"Changes for the Better" represents the Mitsubishi Electric Group's attitude to "always strive to achieve something better", as we continue to change and grow. Each one of us shares a strong will and passion to continuously aim for change, reinforcing our commitment to creating "an even better tomorrow".

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.

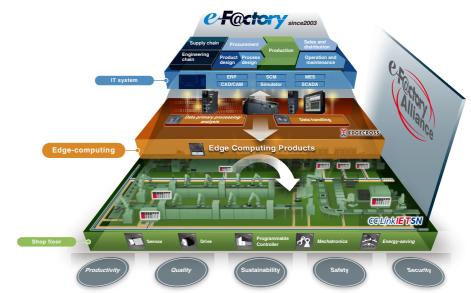
Information and Communication Systems

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 line-up, 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



Our advances in AI and IoT are adding new value to society in diverse areas from automation to nformation systems. The creation of game-changing solutions is nelping to transform the world, hich is why we are honored to be cognized in the 2019 "Forbes gital 100" as one of world's mos digital corporation

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New generation makes it's mark in a continuously updated lineage.



MP series

MPseries

Outstanding accuracy for the most critical application in the field of the world

STE P

MITSUBISHI



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MP series

6

Wire-cut EDM to meet to anticipations for Ultra-high accuracy





Wire-cut EDM Systems Line-up

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







Product Line-up ADVANCE MUS

MITSUBISHI



Machining accuracy ±2µm achieved (Note 1) (Note 1) Machining accuracy follows Mitsubishi Electric machining conditions.

(Automatic elevation tank)



machining conditions.

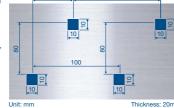


Machining accuracy ±2µm achieved (Note 1) (Note 1) Machining accuracy follows Mits bishi Electric



(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: Ø0.2(.008")/BS • Room temperature: 20°C±1°C 30

680(26.8) 760(29.9) 457(18 3030(119.3) 19.21 + + + +0+0 + + 72-M8 tapped holes * * <Table drawing> **†**•† 600(23)6) Travel One-piece 4-sided table hardened 110(4.3) stainless steel 1 Front Standard machine specifications MP1200 **Model** Max, workpiece dimensions [mm](i 810(31.9)×700(27.6)×215(8.5) Max. workpiece weight [kg](lb) 500(1102) Table dimensions 640(25.2)×540(21.3) (4-sided) [mm](in) Machine travels (X×Y×Z) 400(15.7)×300(11.8)×220(8.7) (XY axis OPT-drive specifications) [mm](in) Aachine unit

<Outline drawing>

300st

(4.3)

555(21.9)

One-piece 4-sided

table hardened

stainless steel

<Outline drawing>

2760(108.7)

(4.3)

1325(52.2)

640(25.2)

† Front †

	Machine travels (U×V) [mm](in)	±60(2.4)×±60(2.4) (OPT-drive specification
	Max. taper angle	[°]	15°(max. 200mm(7.9'
	Wire diameter	[mm](in)	
	Weight	[kg](lb)	3100(6834)(including dielectric flu
	Tank capacity	[L](US gal)	550(145)
	Filtration method		
ielectric fluid	Filtered particle size	[µm]	
eservoir	Water purifier (ion exchan	ge resin) [L](cu.ft.)	
	Dielectric fluid chiller	unit	
	Weight (dry)	[kg](lb)	-(included in machine unit
ø0.2(.008") DD g	guides and ø1.5(.06") jet no	ozzle are standard equi	pment.
General input		[kVA]	
Required air rate	Air pressure	[MPa](psi)	
equired air rate	Air rate	[L (cu.ft.)/min]	

Standard functions		Option	
Maisart Automatic wire threading Digital-AEII power supply LAN/W (Ethernet) FTP/DNC (S/W) Angle Master (S/W)	Anti-virus protection Sleep mode Super-DFS power supply Built-in scheduler	 Ø0.05, Ø0.07 Autom Angle Master ADVAt Angle Master ADVAt Angle Master ADVAt 	

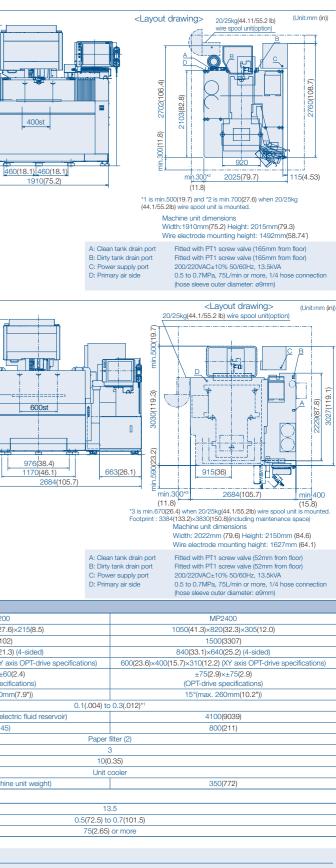
Detail on the other page

MP1200

<Table drawing>

MP2400

MP series



- Option Box
- 20/25kg(44.1/55.2lb) wire
- spool unit
- External signal output
 Built-in warning light
- Run time
- 4-piece filter system
- Filter automatic switching
- (4-piece filter system)Temperature monitoring functionMachining support system (NV-2)
- - Please note that the appearance and specifications are subject to change without notice.

Product Line-up

-

MITSUBISHI

<u>SELIES MP</u> Water Technology

(Note 1) Machining accuracy for

machining conditions.

MP4800

4-axis LSM (XYUV linear shaft motor) Separated 4-sided hardened table

Machining accuracy ±2µm achieved (Note 1)

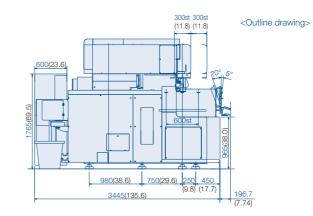
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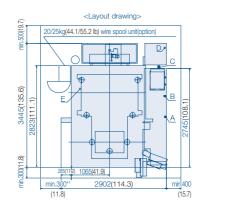
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(Automatic elevation tank)

TE .O

MP4800





*1 is min.570(26.4) when 20/25kg(44.1/55.2lb) wire spool unit is mounted. Footprint : 3602(141.8)×4245(167.1)(including maintenance space)

Machine unit dimensions Width:2550mm(100.4) Height:2415mm(95.1)

A: Clean tank drain port Fitted with PT1/2 screw valve (52mm from floor) A: Clean tank drain port Fitted with P11/2 screw valve (52mm from floor) B: Dirty tank drain port Fitted with P11/2 screw valve (60mm from floor) C: Dirty tank drain port Fitted with PT1 screw valve (60mm from floor) D: Power supply port 200/220/AC±10% 50/60Hz, 13.5k/VA E: Primary air side 0.5 to 0.7MPa, 75/Jr/ini or more, 1/4 hose connecti (hose sleeve outer diameter: o9mm)

	Model		MP4800		
	Max. workpiece dimensions [mm](in)	1250(49.2	2)×1020(40.2)×305(12.0)		
	Max. workpiece weight [kg](lb)	×	1500(3307)		
	Table dimensions [mm](in)	1080(42.5)×870(34.3) (Separated 4-sided table)			
Machine unit	Machine travels (X×Y×Z) [mm](in)	800(31.5)×600(23.6)×310	(12.2) (XY axis OPT-drive specificat	ions)	
viacrime unit	Machine travels (U×V) [mm](in)		75(2.9)×±75(2.9) drive specifications)		
	Max. taper angle [°]	15°(max. 260mm(10.2"))			
	Wire diameter [mm](in)		004) to 0.3(.012)*1		
	Weight [kg](lb)		5800(12786)		
	Tank capacity [L](US gal)		1100(291)		
	Filtration method	Paper filter (4)			
Dielectric fluid	Filtered particle size [µm]	3			
eservoir	Water purifier (ion exchange resin) [L](cu.ft.)	10(0.70)			
	Dielectric fluid chiller unit	Unit cooler			
	Weight (dry) [kg](lb)	450(992)			
ø0.2(.008") DD	guides and ø1.5(.06") jet nozzle are standard equipment.				
General input	[kVA]		13.5		
	Air pressure [MPa](psi)	0.5(72.5) to 0.7(101.5)		
Required air rate [L(cu.ft.)/min]		7	5(2.65) or more		
Standard fu	nctions	Option			
Automatic wire threading Digital-AEII power supply LANW LANW Super-DFS power supply FTP/DNC (S/W) Apiece filter system Angle Master (S/W)		Angle Master ADVANCE II (S/W) Angle Master ADVANCE II dice kit ø0.2 Angle Master ADVANCE II dice kit ø0.25	 Option Box 20/25kg(44.1/55.2lb) wire spool unit External signal output Built-in warning light Buint-image 	Filter automatic switching Temperature monitoring function Machining support system (NV-2)	

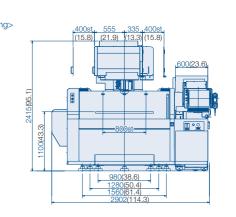
Stand	lard t	functions	

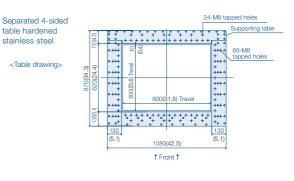
reading	•	Anti-virus	protect

- - Angle Master ADVANCE II dice kit Ø0.25
- Super-DFS power supply
 4-piece filter system
 Built-in scheduler
- Dynamic thermal protection (DTPro)

- Detail on the other page

MP series





- spool unitExternal signal outputBuilt-in warning light
- Run timer
- Temperature monitoring function
- Machining support system (NV-2)

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Product Line-up

Functions and Features

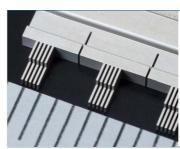
Fully equipped with useful functions for the manufacturing workplace, featuring refined style, high performance, energy savings, simple operation and vast expertise.



Sample <u>Ser</u>



Revolutionize manufacturing with next generation high performance machining



Fine shape n	nachinin
Model	MP1200
Electrode material	Ø0.05(.002")/
Workpiece	Steel
Workpiece thickness	0.5 to 1.0mm
Surface roughness	Rz0.80µm/Ra
Machining accuracy	Shape accura



Stepped	
Model	MP1200
Electrode material	Ø0.2(.008")/
Workpiece	Steel(SKD11
Workpiece thickness	10(.393") to
Surface roughness	Rz1.6µm/Ra
Machining accuracy	±2µm(.0000

Corner	
Nodel	MP1200
Electrode material	Ø0.2(.008")/B
Vorkpiece	Steel(SKD11)
Vorkpiece thickness	30mm(1.18")
Surface roughness	Rz2.5µm/Ra0
Machining accuracy	±2µm(.00008

±1.5µm straightness tall punch machining Model MP2400 Electrode material Ø0.2(.008")/MEGACut TypeA

IVIOUCI	1011 2400
Electrode material	Ø0.2(.008")/
Workpiece	Steel(SKD11
Workpiece thickness	100mm(3.93
Surface roughness	Rz0.8µm/Ra
Machining accuracy	Straightness

1.3µm roundness circular machining

Model	MP2400
Electrode material	Ø0.2(.008")/E
Workpiece	Tungsten ca
Workpiece thickness	80mm(3.15")
Surface roughness	Rz0.6µm/Ra
Machining accuracy	Roundness 1.3

±1.5µm accuracy pitch machining

 Model
 MP4800

 Electrode material
 ø0.2(.008")/BS

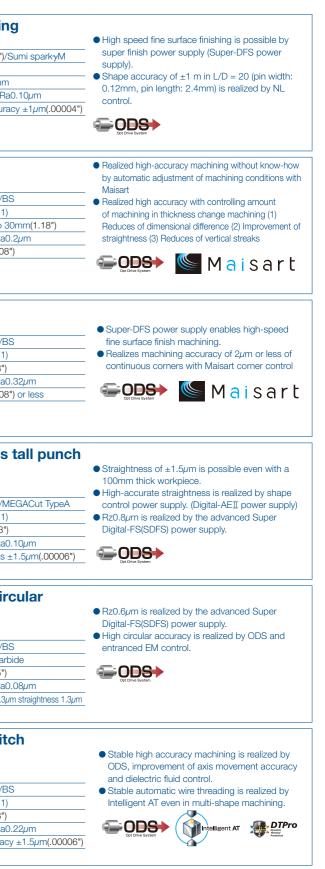
 Workpiece
 Steel(SKD11)

 Workpiece thickness
 30mm(1.18")

 Surface roughness
 Rz1.8µm/Ra0.22µm

 Machining accuracy
 Pitch accuracy ±1.5µm(.00006")

13



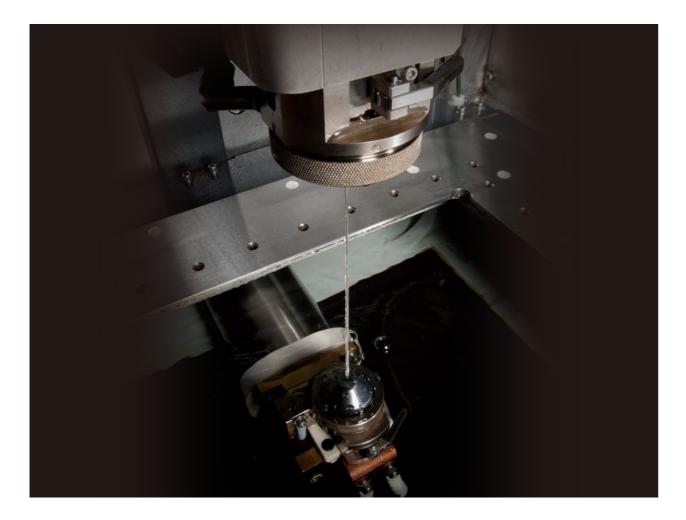
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Results are obtained in our environment and best values are included as well. Result may differ depending on machine installation environment and machining specifications etc.

Automatic Wire Threading

Advanced technology for greatly improved productivity





Improved automatic wire threading

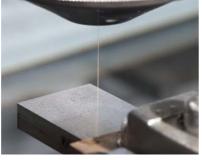
- New annealing system greatly improves wire threading with curl ratio up to 10%.
- Wire break point insertion is greatly improved for thick workpieces.
- Suitable wire threading can be set for workpiece shape (jet on, jet off and submerged break point insertion).
- Automatic threading time is reduced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



drog







Automatic threading with 0.05 wire electrode into a $\wp 0.2$ start hole

Wire electrode annealing structure

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

Jet mechanism

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

Wire collection unit

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



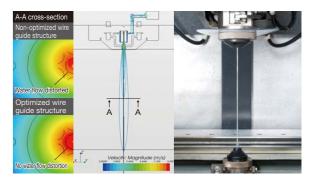
One-touch lever clamp mechanism

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









Maintenance management

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

INITIAL SET	TINGS	OPE	RATION		MANEGEMENT	
Inspection	Operation	Consumption	Cost	File menag	errier	-
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a morkpane		Update		-		
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Lower Roller		Update		-		
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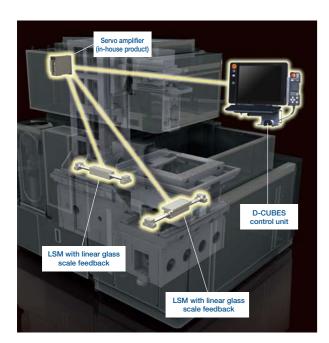
Diamond guide

- 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 flush cups.



Machining Accuracy

Next-generation drive system and optimum machine structure



Highly rigid structure

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



Axis movement accuracy

- Waving is reduced with adopting a high-precision linear guide.
- Ultra-high accuracy linear guides are carefully installed on precisely machined mounting surfaces to provide straightness accuracy of 1 to 2µm.

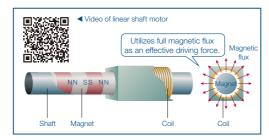


Optical Drive System

- · 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.

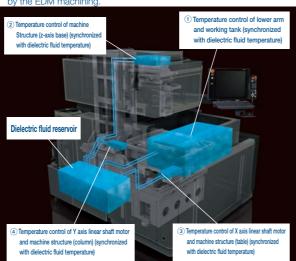
Linear Shaft Motor(LSM)

- Power consumption is reduced by utilizing a full 360° magnetic flux as 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.



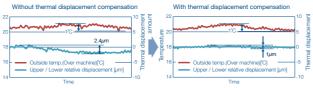
Thermal Stability System

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



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

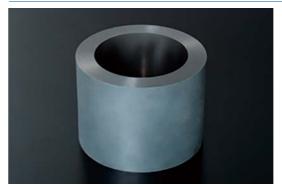
Connector (MP1200)

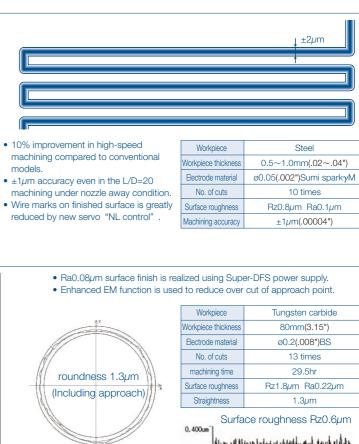


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models

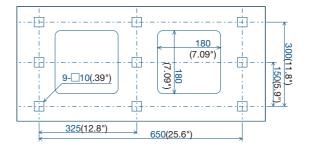
Roundness (MP2400)





Pitch (MP4800)

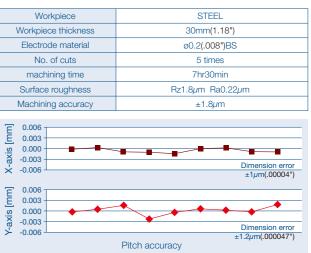




MP series



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



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Results are obtained in our environment and best values are included as well. Result may differ depending on machine installation environment and machining specifications etc.

Machining Accuracy



Water Technology

Anale error

* Angle Master ADVANCE II

guide kit is optional * Max. taper angle is 45° (at max. 40mm)

Taper accuracy

- Taper accuracy of ±0.01° and dimensional accuracy of ±5 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: ø0.2(.008")/BS Workpiece: Steel (SKD11) t20mm(0.79")

Angle Master ADVANCE I (option)

• Taper angle accuracy is more consistent in all taper directions





Straigh

Taper 10 degree

Machining accuracy of thick workpiece

- 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).
- Surface roughness of Rz0.8µm/Ra0.1µm is realized using Super-DFS power supply.



Vire electrode: ø0.2(.008")/MEGA TypeA
Norkpiece: Steel (SKD11) t100mm(3.94")
Surface roughness: Rz0.8µm/Ra0.10µm

Shape control power supply (Digital-AEI)

Dimension error

+X

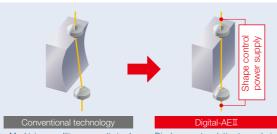
High-accuracy taper machining using round guide

· Highly accurate machining of extremely small tapered sections is now possible

Angle Master Function realizes highly accurate machining of large tapered sections

• Uniform die edge land cuts are possible

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



• Machining conditions are optimized Number of cuts are increased. • Upper/lower dimension difference is compensated mechanically (taper angle)

Discharge rate relative to workpiece thickness is monitored by electricaldischarge position control.

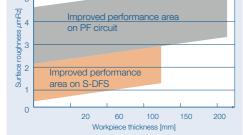
Super-DFS power supply (standard)

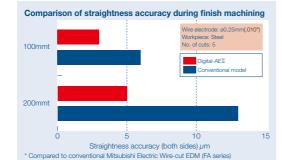
 Realizes surface roughness of Rz0.6µm/

Finishing

- Ra0.08µm. (steel)
- Machining with workpiece set directly on table. (insulation jig not
- required) Machining range not limited. (entire XY stroke

area)





Machining Control

Al tecnology-Maisart Nozzle away control

Original AI technology-Maisart is optimizes machining conditions and improves machining accuracy without know-how. Realizes high accuracy with controlling amount of machining depending on situation of nozzle away. • Improves straightness accuracy with reducing dimensional differences due to in nozzle away or thickness.

Beduces vertical streaks in areas where thickness changes



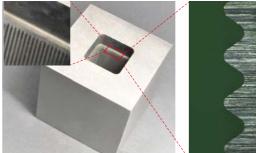


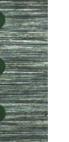
Electrode : ø0.20mm(.008") BS Workpiece : Steel (NAK80) Thickness : 20(.078") to 40mm(.016") Roughness : Rz3.2µm Ra0.4µm

For Maisart Machining condition search screen

Corner control

- As for machining that roughness is more than 1.6µm and shape accuracy is ±5µm, corner control adjustment is not required even in complicated shapes. • As for cornerR machining that is more than wire diameter, corner control adjustment is not required even at continuous corners.
- Realizes accuracy error of $\pm 2\mu$ m or less at straight part of corner start and end.
- 50% productivity improvement for replacement from oil specifications wire EDM.
- Improves accuracy / stability of machining conditions for copper machining.





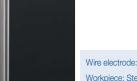
ø0.20 (.008") BS $\times 50$ Steel 50mm. Nozzle away value Upper 5mm/Lower 10mm

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

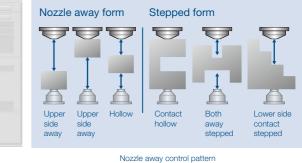
• Reduces dent of approach point of workpiece.

· Allows shape adjustment from convex to concave

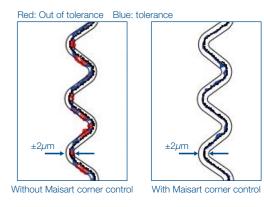


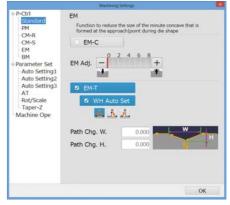












Under-cut adjustment screen

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Productivity

Advanced Productivity

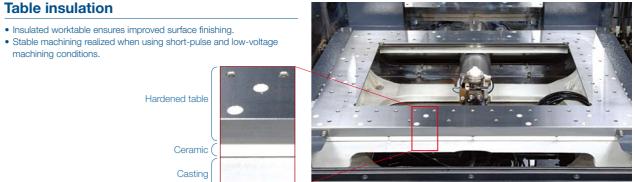


Rz0.6µm tungsten carbide finish

- 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 higher productivity characteristic of water fluid.

Table insulation

- Stable machining realized when using short-pulse and low-voltage machining conditions.



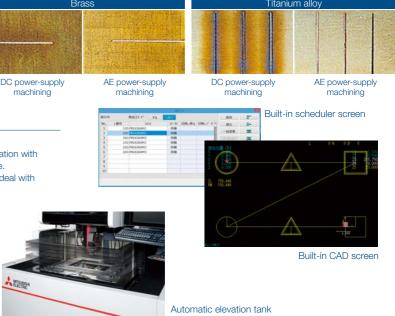
High-speed anti-electrolysis power supply (Digital-AE I power supply)

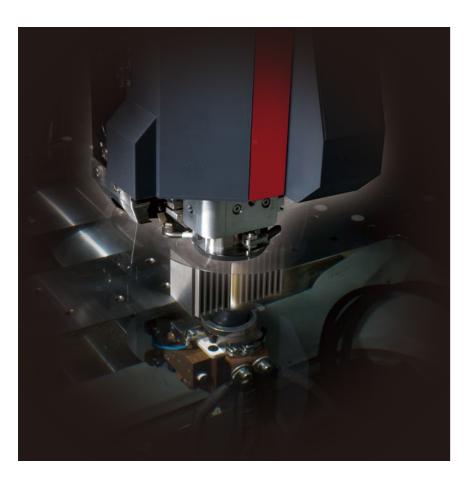
- Electrolytic corrosion is suppressed, preventing formation of soft lavers.
- Compatible with all power circuits, from rough machining to finish machining.
- High-speed, safe unmanned machining possible using water.

Alum	inum	B	rass
			AND ADDRESS TO
DC power-supply machining	AE power-supply machining	DC power-supply machining	

Built-in scheduler

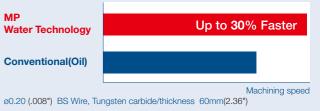
- Built-in scheduler
- Non-stop machining, at night or on weekend, in combination with
- automatic wire threading that has reputable performance. Height of machining tank adjusts automatically and can deal with
- materials of different heights. (OverFlow mode)





Improved power supply performance, improved total machining time









Operability

Control unit

• Information is displayed on a new large19-inch touch screen

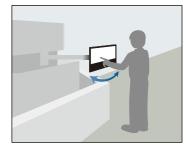
• Keyboard and mouse are standard

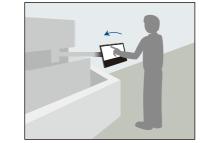
• Intuitive operation is performed by gestures from a multi-touch supporting panel



Screen tilt mechanism

• New tilt mounting system allows adjustability to fit operators of varying heights.



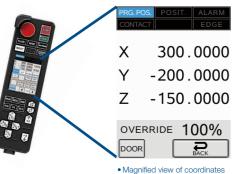




Thin liquid-crystal hand-held pendant box

• New design of thin liquid crystal manual pendant box improves workpiece setup and saves time.

• Pendant box is equipped with a LED flash light mounted on back.





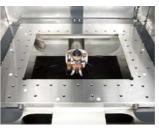
Screen customization



Teaching function

Hardened table and all stainless steel structure

- Equipped with a hardened
- table. • 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 stainless-steel seal plate.



Storable top cover (only MP4800)

• Top cover that swings open and gets stored side, allowing easy workpiece bringing into the machine.



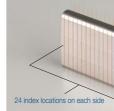


Jet cleaning nozzle /

• Convenient location of the jet cleaning nozzle makes tank cleanup easy



Flat power feed terminal • Flat shape makes it easy to index to next location.



A total of 48 index locations can be used (24 on each side



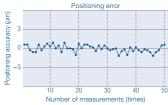
Wire alignment

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



High-accuracy edge positioning

- Greatly improved positioning accuracy.
- Positioning time halved as compared to the conventional model when using high-speed mode.





Dielectric fluid flow meter and jet flow adjustment valve

- Dielectric flow meters are easy to visibility.
- · Adjustable jet flow valve increases range of work that can be done.





60 60

6

Chiller unit filter • Located easy cleaning



Conveniently located at front for easy maintenance







Operability



HOME

and screen selection.

Easy to understand machining progress

 Machining progress status can be check with a single view. (machining

path, remaining time, consumables)

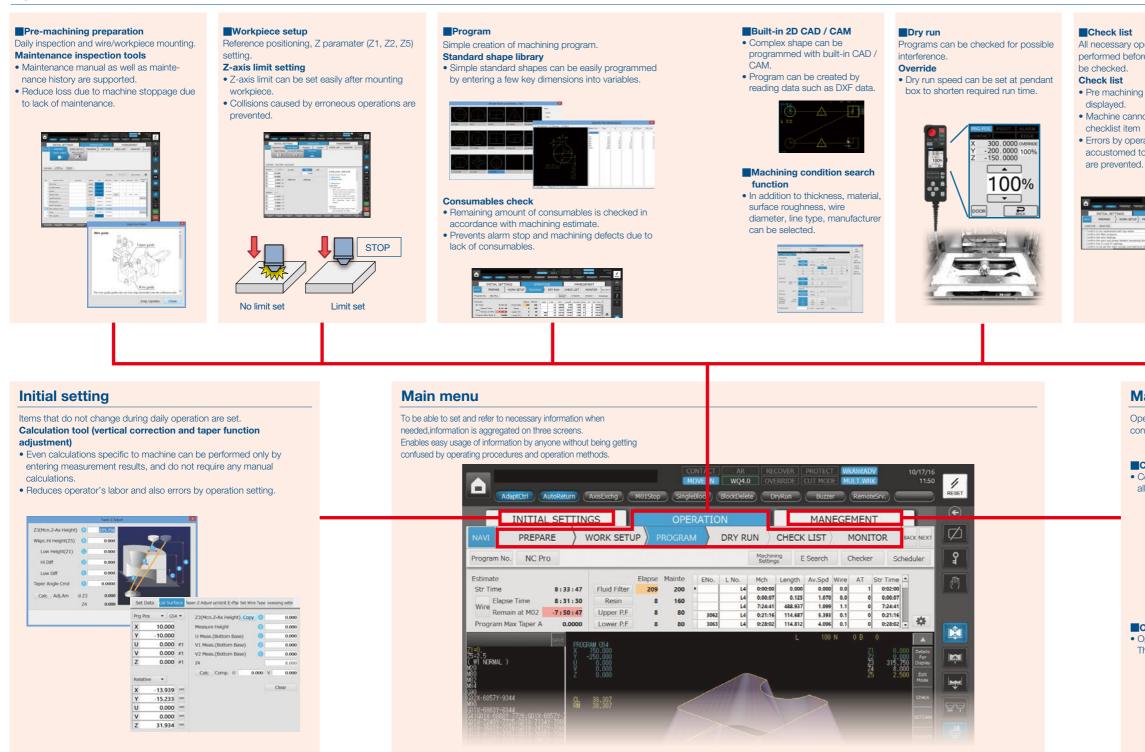
• Operation screens are intuitively selected

by one-touch on screen tiles.

"Fast" and "Ergonomic" operation

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

Operation

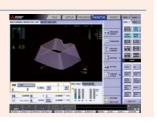


MP series

Classic

Inherited ADVANCE control operability.

- Operations can be performed on previous ADVANCE control style screens for operators that are accustomed to them.
- Easy-to-view with larger size of characters.



All necessary operations to be performed before machining can

• Pre machining checklist is

• Machine cannot be started if any checklist item has been skipped. • Errors by operators who are not accustomed to using machine



Monitoring machining

Start of machining and machining status can be checked.

Resuming machining

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

Automatic setting of adaptive control

• Optimal machining is realized by automatic control setting packed with know-how



Machine log management

Operation history, inspection and maintenance history, consumables, and cost can be managed.

Consumables management

• Consumables screen manages usage time and replacement history of all consumables



Operating cost

• Operating cost can be viewed on cost management screen. This is useful for budget planning.

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Operability

NV-2 [Machining support system] (Option)

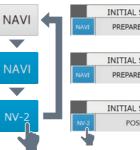
Supporting machining aiming for operability that is easy for all customers to use



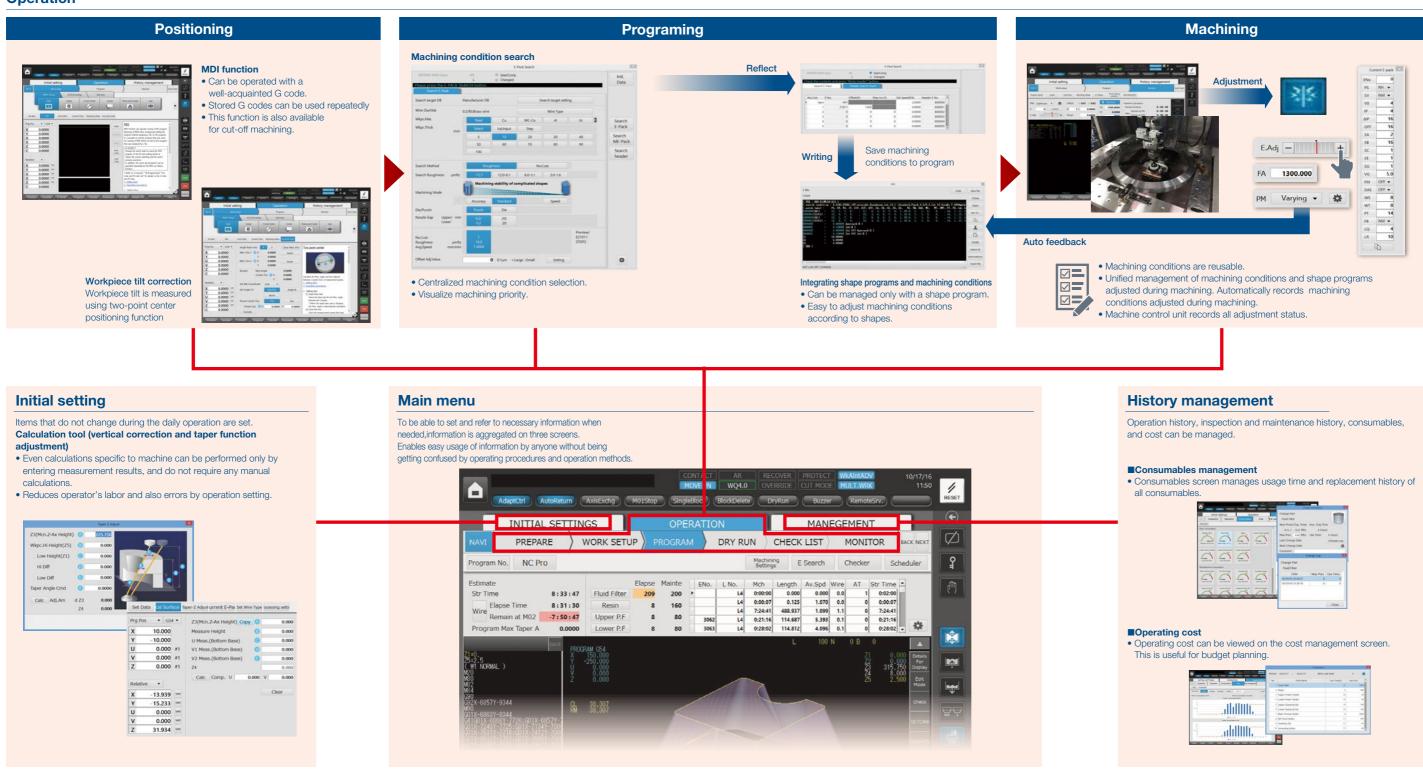
Features of NV2 <Machining support system>

• Positioning and automatic workpiece tilt

- correction using G code by MDI function. • Integrating machining conditions and shape programs.
- Machining conditions adjusted during machining
- are automatically recorded in control unit.



Operation



MP series

L SET	TINGS	OPERAT	ION	MANE	GEMENT	
RE	WORK SETUP	PROGRAM	DRY RUN	CHECK LIST	MONITOR	BACK NEXT
LSET	TINGS	OPERAT	ION	MANE	GEMENT	
RE	WORK SETUP	PROGRAM	DRY RUN	CHECK LIST	MONITOR	BACK NEXT
L SET	TINGS	OPERAT	ION	MANE	GEMENT	
		PROGR	AM	MON	TOR	BACK NEXT

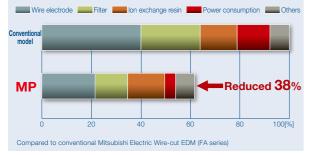
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Energy Savings, Low Operating Cost



Operating cost

• Reduces wires, filters, ion exchange resins, and power consumption which account for 90% of operating costs and reduces total operating costs by up to 38%.



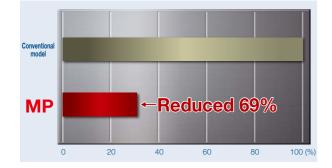


Wire electrode : Ø0.2(.008")/BS Workpiece : Steel(SKD11), t60mm(2.4") Surface roughness : Rz3.5µm/Ra0.45µm/18µ"Ra

Power consumption reduced up to 69%

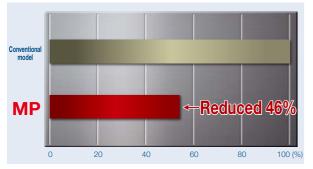
Power consumption reduced by ODS.





Wire consumption reduced up to 46%

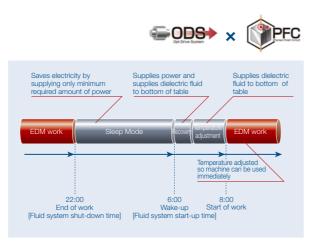
Increased power-supply efficiency reduces wear on wire allowing wire spooling rate to be reduced by PFC.



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

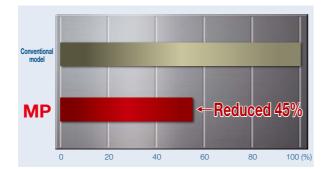
New energy saving mode (Sleep mode)

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



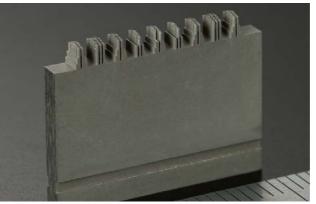
Filter cost reduced up to 45%

• Filter cost is reduced by changing filtration flow rate between rough cut and finishing processes.



Other Functions

ø0.05(.002"), ø0.07(.003") automatic wire threading (option:MP1200/MP2400)



Wire electrode : ø0.05(.002")/SF Workpiece : Steel(PD613), Length 20mm(.79") width 2mm(.08")

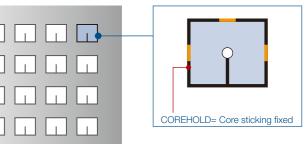
COREHOLD (Option)

- This function allows Slug to be automatically held in place after rough cut for complete unattended operation.
- Slug retention positions and lengths can be set by built-in CAM or CamMagic on the machine.





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





Options



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



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



Run timer Indicates accumulated machining time



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



Wire processing unit Wire is chopped after collection roller



Angle Master ADVANCE ${\mathbb I}$ guide kit Max. 45° tapered machining possible using dedicated diamond guide



4-piece filter system 4-piece filter s ions reduce filter replacen nt frequency



Built-in warning light

Standard



Workpiece clamp set Clamp jigs dedicated for use in holding workpieces



Warning light

Tools (tool box)



Option name		MP1200	MP2400	MP4800	
	UV OPT-drive system specifications	0	0	0	
	Ø0.05 (.002"), Ø0.07 (.003") automatic wire threading*1	•	•	×	
	High precision machining kit (narrow slit)*2	0	0	0	
Machine unit	Wire processing unit*3	0	0	0	
	20/25kg (44.1/55.2lb) wire spool unit	0	0	0	
	Temperature monitoring function	•	•		
	Dynamic thermal protection (DTPro)	×	×	0	
Deverage	Ultrafine finish power supply (Super-DFS power supply)	0	0	0	
Power supply	H-FS power supply	0	0	0	
	4-piece filter system	0	0	0	
Dielectric fluid system	Filter pressure sensor	0	0	0	
System	Filter automatic switching*4	•	•	•	
	External signal output*5	0	0	0	
	LAN/W*6	0	0	0	
Communications	DNC (FTP) (S/W)	0	0	0	
Communications	Built-in scheduler	0	0	0	
	MTConnect*7	0	0	0	
	Operating status data output*7	0	0	0	
	Angle Master ADVANCE II set*8	0	0	0	
Taper Machining	Angle Master ADVANCE II guide kit ø0.2 (.008") (±30°,±45°)*9	0	0	0	
	Angle Master ADVANCE II guide kit Ø0.25 (.010") (±30°,±45°)*9	0	0	0	
	Anti-virus protection	0	0	0	
	Sleep mode	\bigcirc	0	O	
	Maisart				
Software	Nozzle away control	\bigcirc	0	×	
Sollware	Corner control	\bigcirc	0	×	
	COREHOLD	0	0	0	
	3D Data import	0	0	0	
	Machining support system NV-2	0	0	0	
	Optionbox*10	0	0	0	
Display	Warning light*5	0	0	0	
Dispidy	Built-in warning light*5	0	0	0	
	Run timer*5	0	0	0	
	Manual (e-manual)	0	0	0	
	Manual (Booklet)	0	0	0	
Others	LED light	0	0	0	
011015	Wire-alignment device / High-accuracy wire-alignment device	0/0	0/0	0/0	
	Tool box	0	0	0	
	Workpiece clamp set	0	0	0	

- 1 00.05 (002°) to 00.15 (000°) wire electrodes cannot be used with wire processing unit. A dedicated diamond guide is not included.
 Cannot be used with wire processing unit. A dedicated diamond guide is not included.
 Less than 00.15 (000°) wire electrodes cannot be used (These sizes can be used with continuous wire feeder after removing wire processing unit.)
 4-4 price filter system is needed.
 5-Option box is needed.
 7-5-Option box is needed.
 7-5-Salver of either MT Connect or Operation status data output.

5 DAV Gable Shots to as straight with specific your including contracting, carried of contracting of the contracti

Network connection specifications

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

Required specifications	Image drawing	Function	
Operate on the EDM side and receive data from personal computer	Data transmission	LAN/W	Use EDM's Explorer a EDM side. After that, data I/O op
Operate on the EDM side and send data directly to the EDM's NC data area.	Data transmission	FTP	Data can be received
Operate on personal computer side and send data to the EDM	Data transmission	LAN/W	Personal computer's l are used. After that, data I/O op
Operate on personal computer side and send data directly to the EDM's NC data area	Data transmission	DNC	Commercially availabl personal computer sid Refer to DNC specific
Automatically send data from machining machine to FTP server	No person in both	Operating status data output (Option)	Customer should pre
Automatically send data from machining machine to MTConnectAgent	No person in both	MTConnect (Option)	Customer should prep Machine operating St history data are outpu protocol.



MP series

Supplement

r and receive data in common HDD on

operations are required.

ed only using data I/O operation.

s Explorer and EDM's common HDD

operations are required for EDM

able DNC software must be installed on ifications operation for details.

orepare FTP server.

repare MTConnectAgent. Status, alarm data, and machining tput using MTConnect communication



Power Supply, Control Specifications/ Machine Installation

Power supply/Control unit specifications

	Compatible model	MP1200 / MP2400 / MP4800
Power sup	ply unit specifications	
	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
ŧ	Machining setting	45 types
Power supply unit	OFF time	20 types
lqq	Stabilization circuit A	10 types
r su	Stabilization circuit B	20 types
Me	Stabilization circuit C	7 types
P	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 un	it specifications	
	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 to 99.999999 (G code) 0.001 to 9999.999 (S code)
<u>.</u>	Optimum feed control	Automatic selection of machining speed according to gap voltage sensing
unit	Path-retrace control	Reverse path retrace during short-circuit
2	Wire offset	±99999.999mm Offset numbers: 1 to 900 (intersection point calculation)
Contro	Basic screen menu	3 types (Initial setting, operation, history management)
0	Automatic 2nd cut	Interactive screen method
	Machining condition (E-pack) storage	1 to 6999
	Program number command	1 to 9999999
	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
	External dimensions (mm) (in)	518 \times 97 \times 363 (20.3 \times 3.8 \times 14.3) (Excluding keyboard and mouse pad)
	Weight (kg) (lb)	15 (33)

Machine installation checklist **Determining machining details** Check each item, and make sure that no item or order is overlooked. Determine machining site mine pre-processing s 4) Determine post-proce Preparation of installation fixtures Plan installation fixtures 2) Prepare or manufacture fixtu Preparation of consumable parts able parts suc Training of 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 Confirmation of envir ure for radio disturbance, prevention of external nois 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 path inside and outside 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 Factory building entrance dimensions (height × width 3) Constant-tem erature dust-proof room entrance din ns (height × width) Cautions Standard delivery entrance dimensions for standard shipment delivery are given on product line-up page f entrance is smaller than standard delivery entrance, a machine with different dimensions ca Please contact Mitsubishi Electric representative for details (a separate estimate will be issued) Note that delivery may not be possible in some cases depending on dimensions. Installation conditions 1. Installation site ①Constant-temperature dust-proof room Sconsearc-temperature dus-priori notifi 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 EDM in a constant-temperature room when performing high precision machining, even when using skim cuts. Note that an environment where 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 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 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). (2)Tolerable vibration of floor Select a floor where vibration or impact will not be conveyed. As a reference, vibration level should have a max, amplitude of 2μ m or less at a 10 to 20Hz frequency. * Consult with contractor or vibration measuring instrument manufacturer for details suring method ③Foundation · Floor should be concrete with a thickness of 400mm (15.7") or more so it can sufficiently withstand system's weight. - Floor inclination (step) must be within 6/1000 (floor inclination 6mm per 1m) (MP2400 2. Machining heating value Use the equipment capacity to calculate wire-cut EDM's heating value required for designing a constant-temperature room. Heating value (kW) = Equipment capacity (kVA) x 0.6 = 13.5kVA x 0.6 = 8.1kW Above value is a guideline. Consult with constant-temperature room manufacturer for 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 maximum) * Use a 14mm² or thicker cable for primary connection 4. Grounding work Wire-cut EDMs must always be grounded to prevent external noise, radio disturbance and Install a wire-cut EDM in an environment with no corrosive gases, such as acid or sait, or mist, and with low levels of dust. Common grounding can be used if noise from other devices will not enter through common grounding; grounding cable must be connected independently to grounding

location (Fig. 2). • Use a 14mm² grounding wire.

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MP series



- 5. Primary air equipment
 Hose diameter: 1/4 hose (hose sleeve outer diameter: o9.0 (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 automatic wire feeder and work tank door, etc. Air st, from a normal compressor contains various impurities that could cause operation faults if the into pneumatic devices such as solenoid valve. Install an air filter with a drainage discharge mechanism, etc., in air source (primary source) piping to prevent impurities from entering pneumatic devices. der and work tank door, etc. Air supplied t could cause operation faults if they get

6. Shield room

- Install a shield room if a wire-cut EDM affects televisions or other communication facilities in area. Observe following points when installing wire-cut EDM in shield ro I. Ground wire-cut EDM in shield room (Fig. 3).
- If wire-cut EDM cancer to grounding terminal (through bolt) as shown in Fig. 4.
 Consult with 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 power-supply input. By grounding one end of this filter, an earth-leakage current of approx. 30 to 40mA passes through 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 wire-cut EDM. Class C grounding (grounding resistance of 10Ω or less) is recommended for wire-cut EDM. Even if sensitivity current is 200mA, 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

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

Disposal

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

Wire electrodes

Use following wire electrodes	
OB-PN (Ø0.1/BS to Ø0.3/BS)	Oki Electric Cable
HBZ-U(N) (ø0.1/BS to ø0.3/BS)	Hitachi Metals
SBS-HN (ø0.1/BS to ø0.3/BS)	Sumiden Fine Conductors
SWP-SP (Ø0.05/SP to Ø0.07/SP)	Nippon Steel & Sumikin Wire
*Wire electrodes shown above do not guarantee performance	

Recommended sliding surface lubricants

Use one of following lubricants for sliding s	surface As of October 2022
Manufacturer	Product name
Exxon Mobil	Mobil DTE26
Idemitsu Kosan	Super Hydro 68A
Shell Lubricants Japan	Terrace Oil 68
ENEOS Corporation	Super Mulpas DX68

Terms of warranty

1.Terms of warranty

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

2.Coverage

(1)Terms of repairment free of charge Parts labor and travel are included free of charge when failure occurs during normal use for stated Terms of warranty (based on proper usage and maintenance as described in operations manual and sales agreement

Coverage exceptions

1)When a failure occurs that was caused by a machine modification that directly affects machine's functioning or accuracy. When a failure occurs caused by use of non-standard parts, consumables or lubricants

When a failure occurs caused by a natural disaster such as lighting, earthquake or storms and flooding. When use of non-recommended consumables or aftermarket parts are used such as filters or flushing nozzles.

(USIning nozzes). (2)Exclusion of loss in opportunity and secondary loss from warranty liability Regardless of gratis warranty term, Mitsubishi Electric shall not be liable for compensation to: ①Damages caused by any cause found not to be responsibility of Mitsubishi Electric. ②Loss in opportunity, lost profits incurred to user by Failures of Mitsubishi Electric. ③Special damages and secondary damages whether foreseeable or not, compensation for a opident and campacenties for domagen to marking what help Mitsubishi Electric products.

for accidents, and compensation for damages to products other than Mitsubishi Electric products. (a) Replacement by 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 warrant 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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MEMO

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MEMO

MP series

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MEMO

YOUR SOLUTION PARTNER



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, established in 1921, 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 183 factories, laboratories and offices worldwide in over 140 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 146,000 people, Mitsubishi Electric has the resource and the commitment to deliver the ultimate in service and support as well as the best products.

Automation solutions





Processing machines: EDM, Lasers



Global Partner. Local Friend.



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