for a greener tomorrow

MITSUBISHI ELECTRIC
Changes for the Better

FACTORY AUTOMATION

MITSUBISHI NC EDM SYSTEMS
EA-PS Series

EA-PS
series

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.

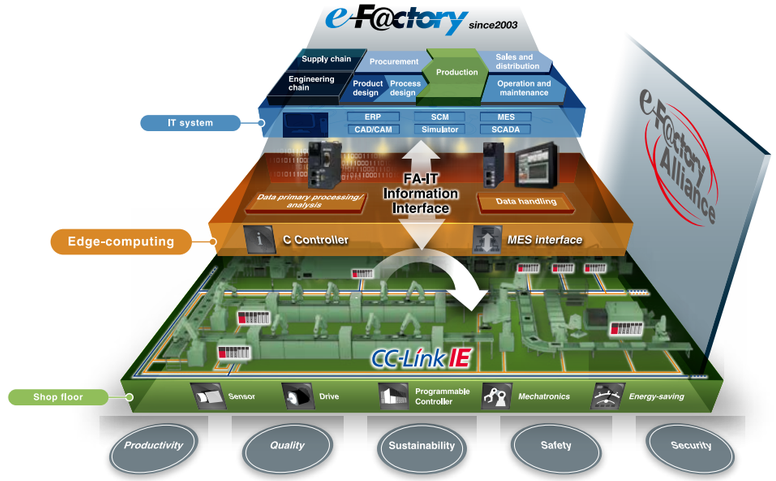
Electronic Devices
A wide portfolio of cutting-edge semiconductor devices for systems and products.

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

The history of Mitsubishi Electric EDMs is the history of electrical-discharge machining

1964

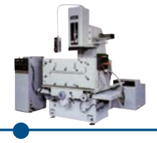
DM201
Thyristor power supply
Hydraulic servo system
Production started 1964

DM500+DE90T
Began shipment in Nov. 1965

DM250+DE30T
Transistor pulse power supply
Began shipment in Feb. 1967

DM100
Began shipment in Dec. 1971

DM300N+EP120M
Began shipment in Jul. 1972



DK700
Began shipment in Oct. 1974

DK280
Began shipment in Apr. 1976

DK140
Began shipment in Sep. 1978

DK360NC
Began shipment in May 1980

M35K
Began shipment in May 1986

M25KC4
Equipped with ultralow-wear power supply (slope control system)
Began shipment May 1986

M55C6
Equipped with 16bit CNC
Began shipment in Dec. 1982

M25C3
Began shipment in Dec. 1982

M55
Began shipment in Dec. 1982

M35C2
Began shipment in May 1982

M30
Motor servo system
Began shipment in Jan. 1982

M85KW
Began shipment in Feb. 1987

M115K
Began shipment in Jan. 1998

EML20
Began shipment in Aug. 1988

M35J
Began shipment in May 1989

M35S
Began shipment in Dec. 1989

M65E
Began shipment in Mar. 1990

V35F
Equipped with 32bit CNC and FUZZY Control
Began shipment in Feb. 1991

EA12E
Equipped with 64bit CNC
Began shipment in Aug. 1999

EDSCAN8E
Began shipment in May 1996

EX30
Began shipment in Jun. 1996

EX8
Began shipment in Jan. 1995

VX20
Began shipment in Jan. 1995

VX10
Began shipment in Dec. 1994

ADMAQ-E
Began shipment in Oct. 1994

VP35F
NS powder specifications
Began shipment in Jun. 1992

EA8
Began shipment in Oct. 1999

VA10
Began shipment in Apr. 2001

MA2000
Equipped with thermal displacement compensation
Began shipment in May 2001

EA8P
Began shipment in Feb. 2004

EA12V
Equipped with V power supply (tungsten carbide circuit standard equipment)
Began shipment in Apr. 2004

EA8PV
Equipped with ultrafine matte finish circuit (NP circuit)
Began shipment in Jun. 2006

EA28V
Began shipment in Jan. 2007

2016

EA12PS
Began shipment in Feb. 2016

EA8PS
Began shipment in Feb. 2016

EA12S
Began shipment in Mar. 2015

EA8S
Began shipment in Feb. 2014

EA8PV ADVANCE
Began shipment in Feb. 2008

EA28V ADVANCE
Began shipment in Feb. 2008

EA12V ADVANCE
Equipped with ADVANCE control device
Began shipment in Feb. 2008

EA-PS Series

Die-sinking EDMs in response to expectations for high accuracy

EA-PS Series

NC-EDM Systems

An extensive product lineup ready to support the most diversified needs, from high-precision machining of small workpieces to highly productive machining of large workpieces. Mitsubishi Electric die-sinking EDMs offer comprehensive solutions that contribute to improving the productivity of customers' facilities.

Ultrahigh-accuracy machine
MA2000

Flagship model integrating advanced technologies

High-accuracy machine
EA-PS Series

High-grade model compatible for various uses

High-performance machine
EA-V ADVANCE Series

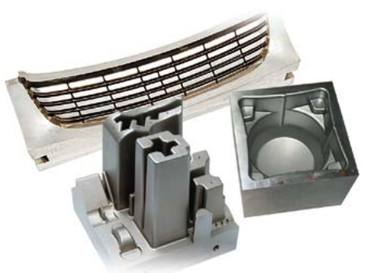
High-class model pursuing accuracy and productivity

Productivity machine
EA-S Series

Supports various machining needs in pursuit of higher productivity

Large-size high-performance machine
EA ADVANCE Series

Standard model pursuing high performance and high productivity



Line-up

High-grade models compatible for various uses

Compact high-accuracy machine

EA8PS

Machining accuracy ±3μm(*1) achieved

(*1) The machining accuracy follows the Mitsubishi Electric machining conditions

Automatic elevation working tank specifications (standard)

Unit : mm(in)

Guaranteed accuracy conditions
- Workpiece:
  SKD11 20mmt
  HRC56-57 after quenching
  Sub-zero treatment
  High-temperature tempering
  Stabilization treatment
- Electrode:
  □5mm 4-copper
- Room temperature:20±1˚C

High-accuracy machine

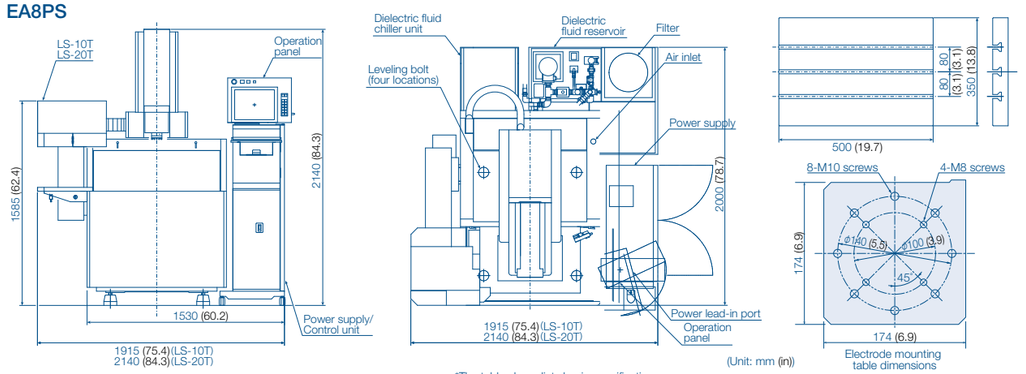
EA12PS

Machining accuracy ±3μm(*1) achieved

(*1) The machining accuracy follows the Mitsubishi Electric machining conditions

Automatic elevation working tank specifications (standard)

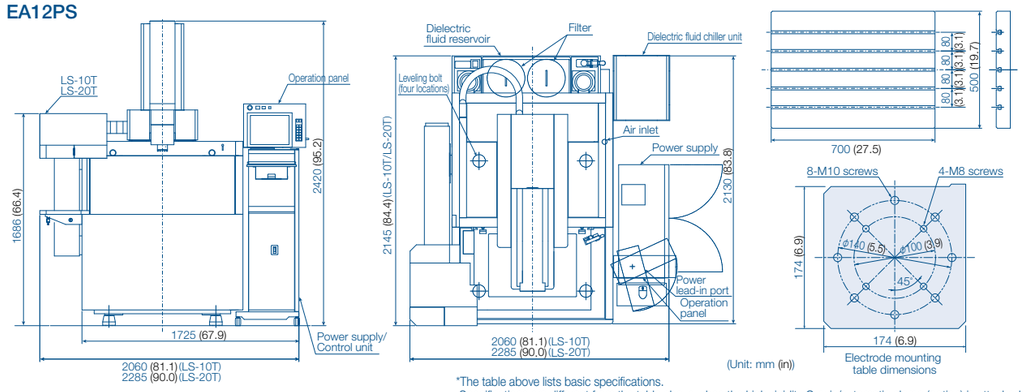
EA8PS



(Unit: mm (in))

*The table above lists basic specifications.
Specifications are different from the table above when the high-rigidity C-axis/automatic clamp (option) is attached.

EA12PS



(Unit: mm (in))

*The table above lists basic specifications.
Specifications are different from the table above when the high-rigidity C-axis/automatic clamp (option) is attached.

Machine main unit (standard specifications)

Model			EA8PSM	EA12PSM
Machine main unit	Dimensions (W x D x H)	[mm(in)]	1530×2000×2140 (60.2×78.7×83.5)	1725×2130×2420 (67.9×83.9×94.5)
	Total system weight	[kg(lb.)]	2000(4409)	3500(7716)
Axial travel	(X×Y×Z)	[mm(in)]	300×250×250 (11.8×9.8×9.8)	400×300×300 (15.7×11.8×11.8)
Spindle	Distance between table and electrode mounting surface	[mm(in)]	150-400(5.9-15.7)	200-500(7.9-19.7)
	Max. electrode weight	[kg(lb.)]	25(55)	80(176.4)
Working tank	System		Automatic elevation system	
	Inner dimensions (W x D x H)	[mm(in)]	800×520×300 (31.5×20.5×11.8)	950×700×450 (37.4×27.6×17.7)
	Fluid level adjustment range (from top of table)	[mm(in)]	85-250(3.3-9.8)	100-400(3.9-15.7)
Table	Dimensions (W x D)	[mm(in)]	500×350(Granite table) (19.7-13.8)	700×500 (27.6-19.7)
	Max. workpiece dimensions (W x D x H)	[mm(in)]	770×490×200 (30.3×19.3×7.9)	900×650×350 (35.4×25.6×13.8)
	Distance between floor and top of table	[mm(in)]	900(35.4)	900(35.4)
	Max. workpiece weight	[kg(lb.)]	550(1213)	1000(2205)
	T-slot		3 slots at 13-80mm pitch	5 slots at 12-80mm pitch
Dielectric fluid reservoir	Capacity (initial dielectric fluid supply amount)	[ℓ(gal.)]	260(68.7)(270(68.7))	360(95.1)(470(124.1))
	Filtering system		Paper filter x 1	Paper filter x 2
	Dielectric fluid chiller unit		Unit cooler	

Distance between table and electrode mounting surface

			EROWA ITS50	3R MACRO	3R Combi MACRO	3R Combi Jr
EA8PSM	High-rigidity C-axis	[mm(in)]	150~400 (5.9~15.7)	133~383 (5.2~15.1)	133~383 (5.2~15.1)	143~393 (5.6~15.5)
	Spindle	[mm(in)]	150~400 (5.9~15.7)	133~383 (5.2~15.1)	133~383 (5.2~15.1)	143~393 (5.6~15.5)
	Automatic clamp	[mm(in)]	150~400 (5.9~15.7)	148~398 (5.8~15.7)	148~398 (5.8~15.7)	158~408 (6.2~16.1)
EA12PSM	High-rigidity C-axis	[mm(in)]	200~500 (7.9~19.7)	183~483 (7.2~19.0)	183~483 (7.2~19.0)	193~493 (7.6~19.4)
	Spindle	[mm(in)]	200~500 (7.9~19.7)	183~483 (7.2~19.0)	183~483 (7.2~19.0)	193~493 (7.6~19.4)
	Automatic clamp*1	[mm(in)]	200~500 (7.9~19.7)	198~498 (7.8~19.6)	198~498 (7.8~19.6)	208~508 (8.2~20.0)

*1 Regarding the distance between table and electrode mounting surface of automatic clamp (head-down specifications), please contact a Mitsubishi Electric representative

C-axis/ATC (option)

				3R MACRO	3R Combi	EROWA ITS	EROWA COMBI
C-axis		Max. electrode weight	10(22)*2 [kg(lb.)]	○	○	○	—
		Speed (rpm)	1~30 [min⁻¹]				
	Spindle type	Max. electrode weight	10(22)*2 [kg(lb.)]	○	○	○	—
		Speed (rpm)	1~1500 [min⁻¹]				
ATC	LS-10T	Max. electrode dimensions	54×54×200 [mm(in)] (2.1×2.1×7.9)	○	○	○	○
		Max. electrode weight	5kg (11lb)/electrode*3 Magazine total: 20kg (44lb)				
	LS-20T	Max. electrode dimensions	54×54×200 [mm(in)] (2.1×2.1×7.9)	○	○	○	○
		Max. electrode weight	10kg (22lb)/electrode*3 Magazine total: 40kg (88lb)				
	MVH-20T	Max. electrode dimensions	70×70×150 [mm(in)] (2.8×2.8×3.9)	○	○	○	*6
		Max. electrode weight	10kg (22lb)/electrode*4 Magazine total: 80kg (176lb)*5				
	MVH-40T	Max. electrode dimensions	70×70×150 [mm(in)] (2.8×2.8×3.9)	*7	*7	*7	*6, *7
		Max. electrode weight	10kg (22lb)/electrode*4 Magazine total: 80kg (176lb)*5				

*2 For MACRO Jr of 3R combi and Compact of EROWA COMBI, the weight is 2.5kg (5.5lb.)/electrode.
*3 For MACRO of 3R combi, the weight is 5kg (11lb.)/ electrode, and is 2.5kg (5.5lb.)/ electrode with MACRO Jr.
*4 For MACRO of 3R Combi, the weight is 5kg (11lb.)/electrode, is 2.5kg (5.5lb.)/electrode with MACRO Jr, and Compact of EROWA COMBI, the weight is 2.5kg (5.5lb.)/electrode.
*5 For MACRO and MACRO Jr of 3R Combi, the magazine total is 40kg (88lb.).
*6 ATC can be used with EROWA ITS50, but not with EROWA Compact (manual only).
*7 The EA8PS does not support the MVH-40T

Standard delivery entrance

		EA8PSM Width[mm(in)]	EA8PSM Height[mm(in)]	EA12PSM Width[mm(in)]	EA12PSM Height[mm(in)]
Without ATC		1120(44.1)	2150(84.6)	1320(52.0)	2445(96.3)
LS type	10T	1505(59.3)	2150(84.6)	1655(65.2)	2445(96.3)
	20T	1730(68.1)	2150(84.6)	1880(74.0)	2445(96.3)
MVH type	20T	1550(61.0)	2150(84.6)	1710(67.3)	2445(96.3)
	40T*8	—	—	1320(52.0)	2445(96.3)

*8 MVH-40T specifications obtained by removing both the ATC main unit and retainer. This is required for installation when using crane and for assembly.

Functions and Features

Integration of advanced machining technologies and ADVANCE control equipment
Supports various types of EDM machining

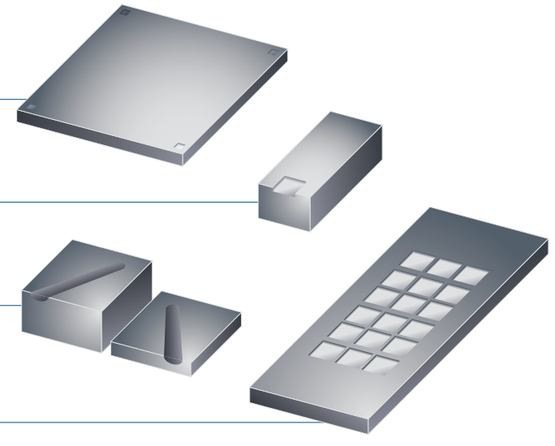
Realizes highly accurate high-speed, low electrode wear machining

Pitch/Shape accuracy: ±2μm

In-Corner radius: 5μm

Machining time up to 40% shorter compared to conventional model

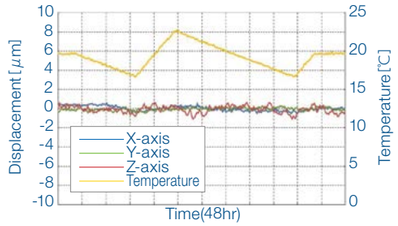
Mold maintenance interval 2.5 times longer compared to conventional surface

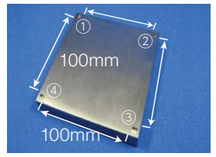


Machining Accuracy

Refer to pages13-14

- ±3μm pitch accuracy achieved *1
  XY-axis linear scale standard equipment
- Standard function of "Thermal buster" (in-house original technology) Temperature change is visualized with "visualization monitor"





Example of pitch machining
- Shape dimension
- Pitch dimension
- Depth dimension

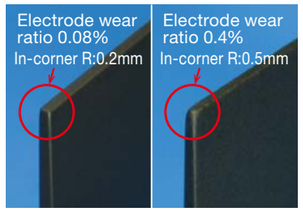
Achieved within ±3μm

*1 The machining accuracy follows the Mitsubishi Electric machining conditions

Productivity

Refer to pages15-16

- Machining speed is up to 40% faster with the combination of highly accelerated (1.6G) jump control and aduptive control "IDPM".
- Ultrafine finish surface of Ra0.05μm is realized with upgraded NP2 circuit.
- New finishing circuit LLTX Mold cleaning interval is extended with improved mold release.



with IDPM　　without IDPM

Material: Steel
Electrode: Graphite
Depth: 20mm

Workability / Operability

Refer to pages17-18

- 3-sided automatic elevation tank standardized
  Automatic emission/suction changeover also standardized.
- Setup time reduced by faster jog operations speed
  Jog operation speed is customizable
- Magnet stand attachment area secured on head
  Incread the number of T-slots on table for easier workpiece setup
- Possible to utilize variables with the ESPER program

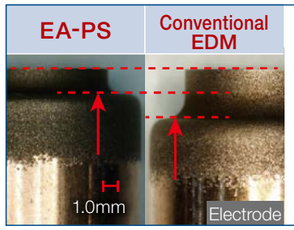
*Compared to conventional model
(EA Series)

Automation compatibility

Refer to pages19

- Enlarged worktank size
  Easily add the table chuck and the rotary axis
- Available of both right and left side controller layout
- ATC can be chooser from LS and MVH tool changer
- Ready for automation system

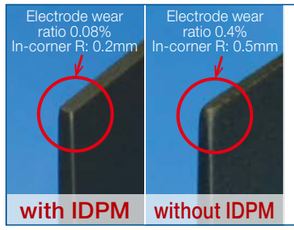
Machining Samples



Low copper electrode wear for tungsten carbide machining

Model	EA8PS
Electrode	Copper
Workpiece	Tungsten carbide (GL60)
Surface roughness	Rz13.0μm/Ra1.9μm
Machining accuracy	±0.003mm

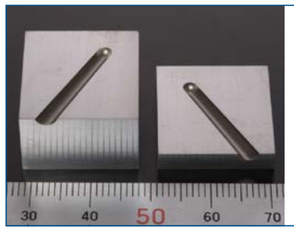
- Newly developed 'HPS circuit' Up to 50% less electrode wear machining using copper electrode (less than 25% electrode weight wear ratio compared to conventional model)



High speed machining with low electrode wear by IDPM+SS jump

Model	EA12PS
Electrode	Graphite (TTK5)
Workpiece	Steel (STAVAX)
Surface roughness	Rz8.4μm/Ra0.11μm
Machining accuracy	±0.010mm

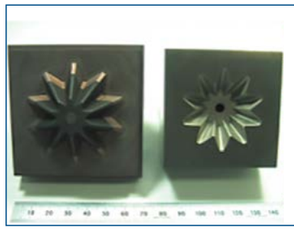
- High speed machining with IDPM+SS jump
- Low electrode wear machining with IDPM (electrode length wear reduced up to 50%)
- Machining time is 30% reduced with boosted up jump speed (compared to conventional model)



Up to 35% faster submarine gate machining

Model	EA8PS
Electrode	Copper
Workpiece	Steel (STAVAX)
Surface roughness	Rz3.3μm/Ra0.43μm
Machining accuracy	±0.003mm

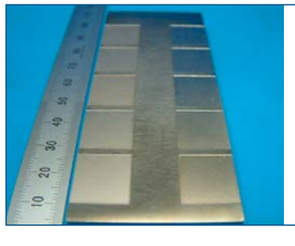
- Machining time for simultaneous 2 or 3 axes operation is reduced up to 35% with improved jump speed
- High speed and high quality machining is realized even with multi axis machining
- Easy programming with shape expert



High speed bevel gear machining

Model	EA12PS
Electrode	Copper graphite
Workpiece	Tungsten carbide
Surface roughness	Rz2.5μm/Ra0.4μm
Machining accuracy	±0.003mm

- Maximum machining speed is twice faster than copper tungsten electrode
- Stable machining is realized with IDPM and SS Jump



Maintenance cycle time of molds increases more than twice

Model	EA12PS
Electrode	Copper
Workpiece	Steel (ASP23)
Surface roughness	Rz3.0~9.8μm Ra0.4~1.6μm

- Uniform machined surface on shapes by LLTX
- Releasing property can be improved by LLTX, eliminating the polish of the plastic mold.

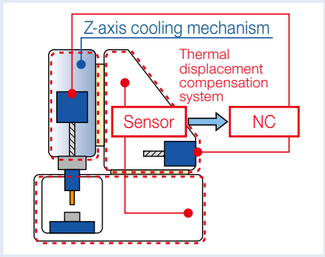
Machining Accuracy

±3μm pitch accuracy achieved*1

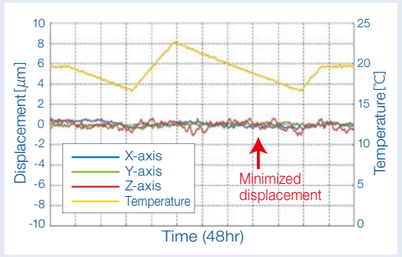
- Standard installation of 'Thermal buster'(in-house original technology)
  - ·Thermal displacement of machine is reduced by Thermal displacement compensation system and Z-axis cooling mechanism
  - ·Temperature change is visualized with 'visualization monitor'
- High accuracy wide stroke pitch machining is realized with in-house NC equipments + original servo technology + high accuracy drive systems

*1 Machining results are all based on in-house conditions and measurements

Explanatory view of thermal buster



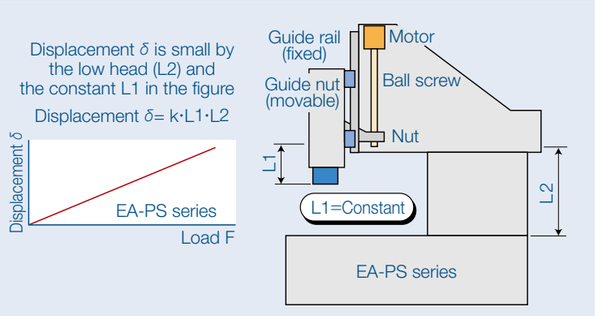
Displacement amount for each axis under ±3℃ environment



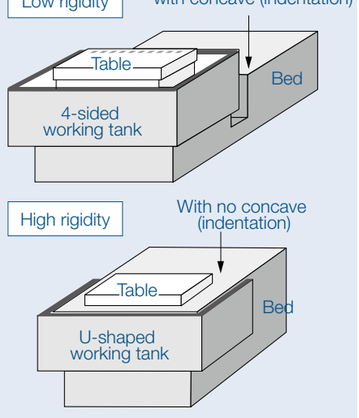
Visualization Monitor screen

High rigidity construction

- Highly rigid Z-axis thanks to low head structure
- Highly rigid integrated bed structure with no concave section (indentation)
- Improved servo responsiveness using direct drive method

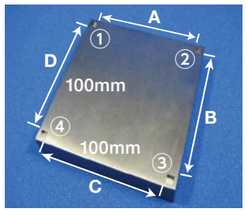


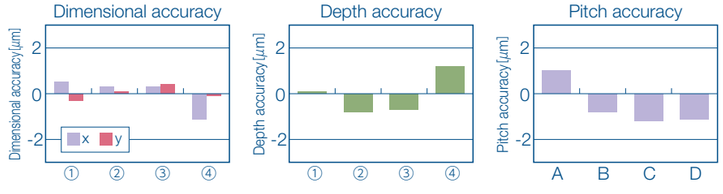
Low head structure



Bed structure

Pitch machining example



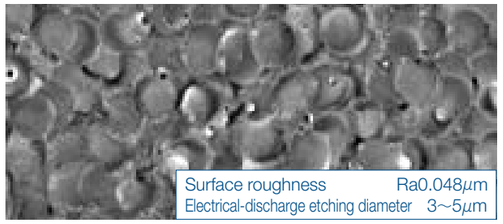


High-rigidity C-axis/High-accuracy spindle

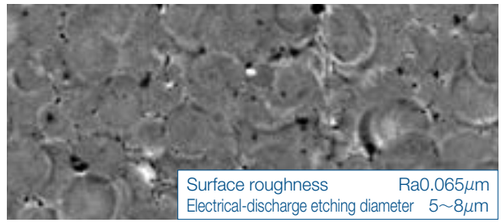
- Highly accurate helical machining and index machining possible
- High-accuracy, high-rigidity C-axis with increased permission moment of inertia

High-quality ultrafine finishing function (NP2 circuit)

- Ultrafine surface roughness of Ra0.050μm has been realized by minimize the floating capacitance



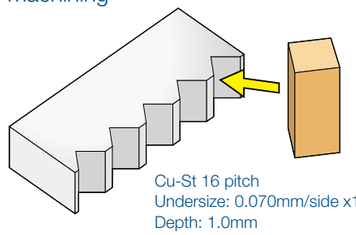
New NP2 circuit



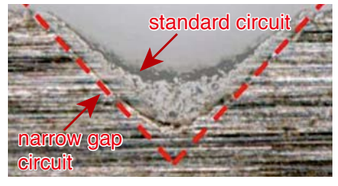
Conventional circuit

Narrow gap circuit

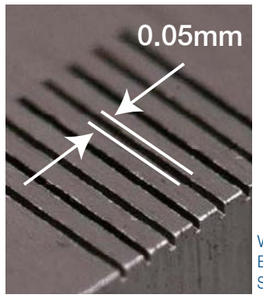
- Compatible with small undersize amounts of 0.015 to 0.030mm per side
- Small in-corner R realized by suppressing electrode wear for small undersize machining



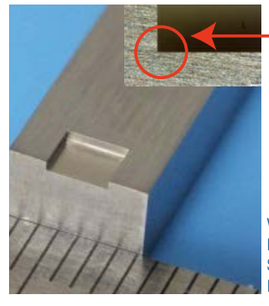
Cu-St 16 pitch
Undersize: 0.070mm/side x1
Depth: 1.0mm



Standard circuit, Narrow gap circuit
Shape after five cuts are made using the same electrode in Cu to St.
undersize : 0.025mm
In-cornor R : minimum 0.005mm
Machining depth : 0.3mm



Workpiece: Steel (SKD11)
Electrode: Copper tungsten
Surface roughness: Rz0.50μm/Ra0.08μm

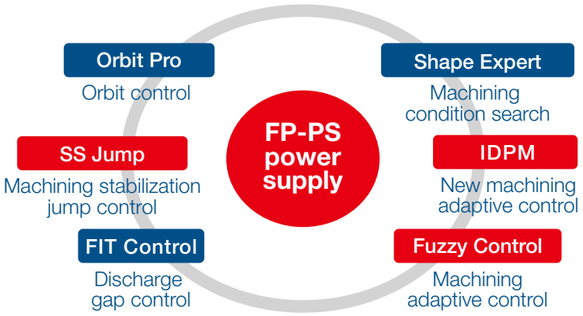


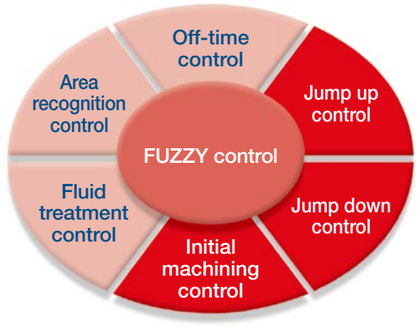
Workpiece: Steel (ELMAX)
Electrode: Copper
Surface roughness: Rz0.30μm/Ra0.048μm
In-corner R: 0.005mm

Productivity

Advanced Machining Control

High-speed machining realized with advanced machining control



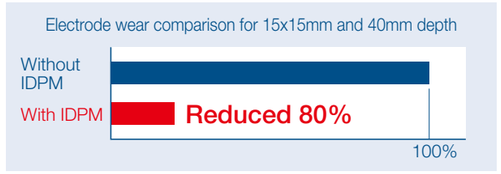


IDPM
- Intelligent Digital Power Master: Adaptive control to be integrated ever developed technologies
- Integrated Discharge Power Monitor: Adaptive control to reduce abnormal discharge with detecting discharge pulse

Machining adaptive control: IDPM

High-speed/Low-wear machining with graphite electrodes

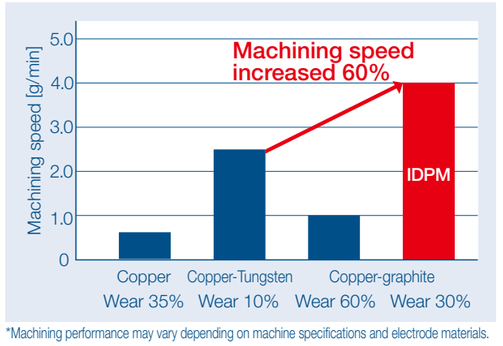
●IDPM reduces graphite electrode wear up to 80%



*Above data is a comparison with a conventional Mitsubishi Electric EDM (EA Series).

Tungsten carbide high-speed machining

●Machining speed is improved up to 60% with-using IDPM and copper-graphite electrode



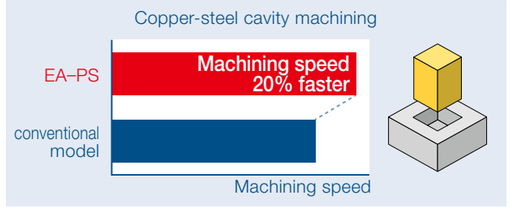
*Machining performance may vary depending on machine specifications and electrode materials.

Machining speed improved with IDPM advanced adaptive control and SS Jump jump control

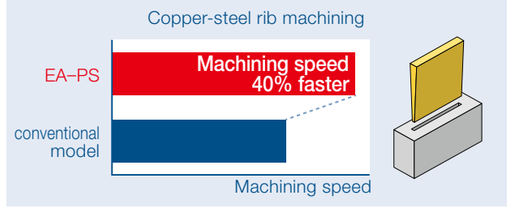
●Mitsubishi Electric's IDPM adaptive control is utilized not only for graphite electrode machining, but widely applied for copper electrode machining as well

●Machining speed increased up to 40% by raising the speed and acceleration of the SS Jump jump control function

▶SS Jump comparison video

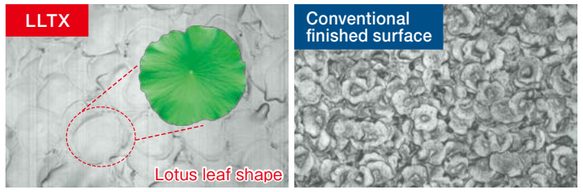


Machining speed for □30mm:depth 9mm machining



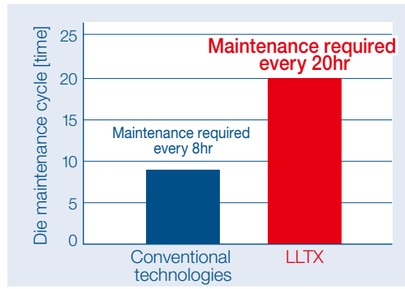
Machining speed for width 20mm:thickness 1mm:depth 20mm machining

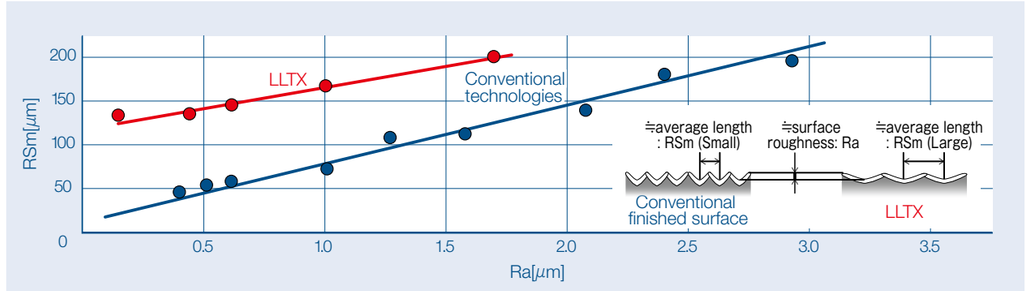
Lotus Leaf Texture (LLTX) glossy mirror-finish function



●Machining steel using a copper electrode enables the acquisition of a larger RSm than conventional machining owing to the improvement in release property

●Extension of the maintenance cycle realizes a longer die service life

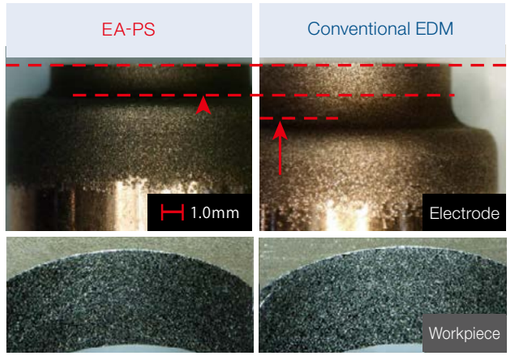


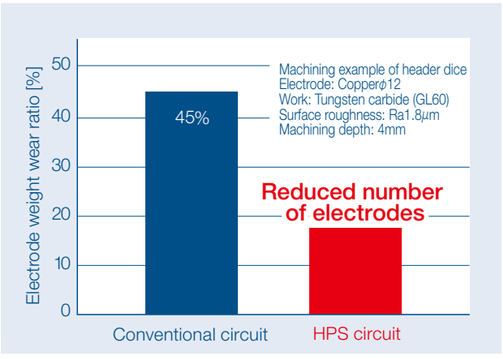


HPS circuit (machining circuit for difficult-to-machine materials)

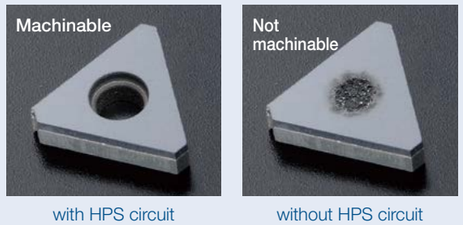
●Electrode wear of copper electrode dramatically improved

●Enables the machining of difficult-to-machine materials including conductive ceramics and diamond-sintered compact, and realizes faster machining compared to conventional power supplies



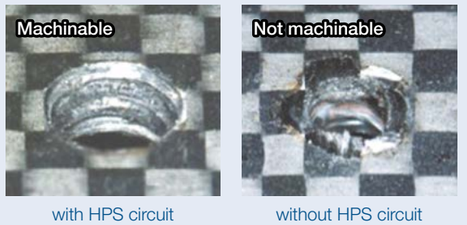


Example of sintered boron nitride machining



with HPS circuit　without HPS circuit

Example of thread machining using carbon fiber-reinforced plastic (CFRP)



with HPS circuit　without HPS circuit

Workability / Operability

Easy-to-use control (ADVANCE control unit)

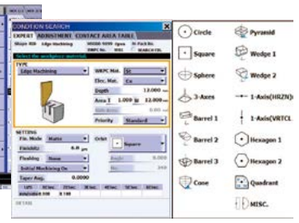
Ergonomic design

- Easy-to-view screen(15-inch)
- Intuitive operation using touch-panel display
- User-friendly keyboard and mouse

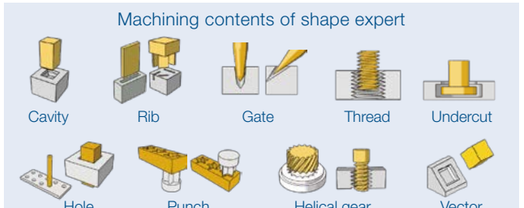
ESPERADVANCE - Easy Programming and machining condition search -

- Programming is possible simply by inputting the machining start position and machining depth, etc., into a table format
- Machining conditions and programs suitable for various shapes can be created (Shape Expert)

Machining program screen

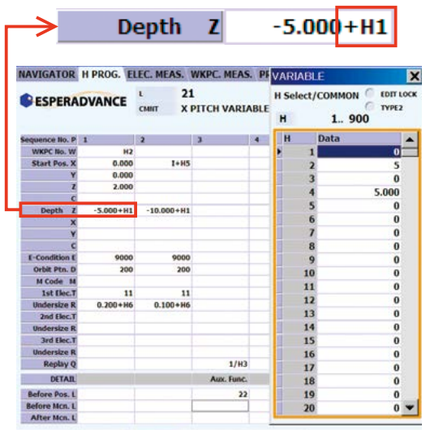


Machining conditions search screen



ESPERADVANCE - New feature -

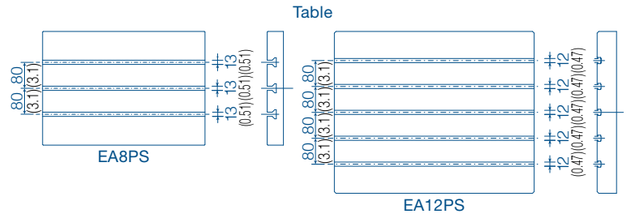
- The input of the variable is possible
  ·Possible to add/subtract the setting value for the adjustment machining.
  ·Easy to keep/manage the adjustment value and effective to prevent the miscalculation.
- The repetition of the program is possible by " Replay Q " function.
  ·Simple program especially in a case of machining location arranged in matrix.
- ESPERADVANCE PRO lite(**) is standard.
  ·Making program, searching conditions and input/output into the machines from PC.
  ·One software can manage 5 machines program and machining condition to duplicate the machining on each machine.



** ESPERADVANCE PRO lite is limited version of ESPERADVANCE PRO. Please refer for the details to Mitsubishi.

Setup

- Incread the number of T-slots on table for easier workpiece setup
- Setup time reduced by faster jog operations speed Jog operation speed is customizable

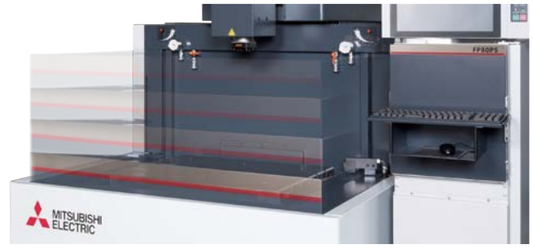


Attachable magnet stand

- Magnet stand attachment area secured on head

3-sided automatic elevation tank

- 3-sided automatic elevation tank standardized. Improved access for workpiece setup

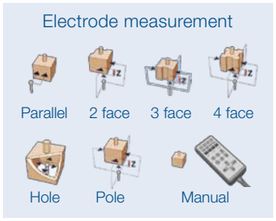


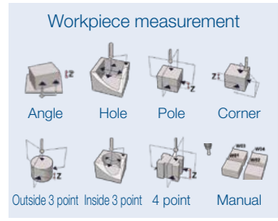
Electrode/Workpiece measurement

- Electrode alignment electrode measurement screen
- Workpiece alignment of workpiece measurement screen

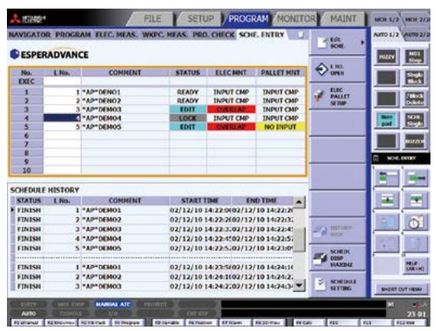
Electrode measurement screen

Workpiece measurement screen





Built-in scheduler

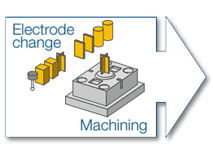


- Continuously run multiple programs on a schedule
- Schedules can be added and edited during machining

Automation Support e-F@ctory

LS-10T/20T Tool changer

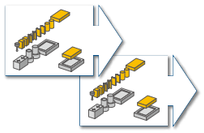
●Automatic electrode replacement enables continuous operation



▼LS-ATC operation

Automatic electrode/workpiece changer(1 robot, 2 EDMs)

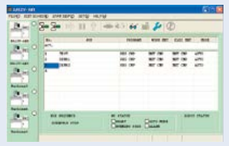
●Robotic transfer devices automatically change electrodes and workpieces, enabling continuous operation



Peripheral equipment/System extension options

Scheduling system

E.S.P.E.R SCHEDULE



●Execute continuous schedule operation of EDMs with job management(*) (manage up to five EDMs)
●Control ID numbers, as well as monitor the mounting state of electrodes and the state of communications with the EDM and electrode / workpiece changing unit

(*) A personal computer is required for installing applications

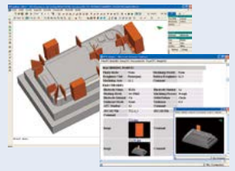
Machine remote monitor

RemoteMagicⅡ

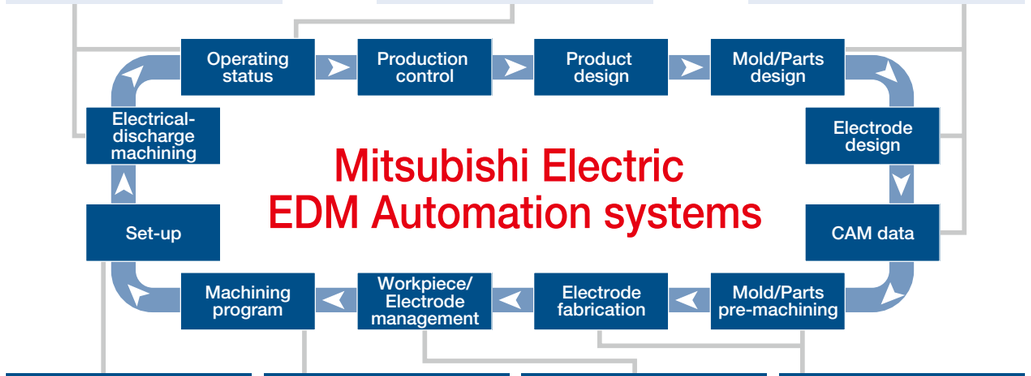
●Visualizes workshop with monitor and notification for improving machine operating ratio
●Remotely monitor machining with a personal computer
●Mail notifications when an alarm occurs

3D CAD/CAM system

AD



●3D electrode model can be created easily, and electrode design CAD system handling orbit deformation
●Die-sinking electrical-discharge CAM system, which calculates machining positions automatically and eliminates value input mistake
●Operations can be sequenced to wire, milling and hole machining CAMs



Touch probe

Electrode touch probe　Workpiece touch probe

●Support in-line setup
Reduces core alignment measurement and measuring time of workpiece position
●Speeds up machine operation by use of installed measuring programs

Offline automatic programming system

ESPERADVANCE PRO

●Offline programming and program management is possible(*)
●Same screens and operability as ESPERADVANCE, and compatible with 64-bit models (MA, EA Series machining condition search is also available)
●Import data from AD or EPX compatible CAD/CAM

(*) A personal computer is required for installing applications.

ID tag system

ID tag system

●Mounting status of carrier device robot is managed by ID tag which mounted electrode and workpiece pallets
●Electrode and workpiece pallets can be identified to prevent mounting mistakes and program registering mistake
●Workpiece and electrode can be easily managed using ID tag system and scheduler

Presetter

Presetter　Coordinate measuring machine

●Supports setup operation at machine offline, and setup time can be reduced
●The usage of offline setup system will improve machine runtime
●Electrode and workpiece can be easily managed using ID tag system and scheduler

(Note 1) Please contact a Mitsubishi Electric representative for more information regarding the presetters and coordinate measuring machines.
(Note 2) Please contact a Mitsubishi Electric representative for more information regarding the ID tag systems.
(Note 3) Please contact a Mitsubishi Electric representative for more information regarding the touch probes.

MEMO

Power Supply/Control Specifications and Options

Power Supply and Control Specifications

Model		EA8PSM Automatic elevation tank specifications	EA12PSM Automatic elevation tank specifications
Power supply unit	Power supply model	FP80PS	
	Maximum machining current peak [A]	80	
	Standard machining circuit and functions	Transfer pulse circuit (TP circuit), Ultralow-wear machining circuit (SC, α-SC circuit), Fine-matte finish circuit (PS circuit), Glossy mirror-finish circuit (GM2 circuit), HPS circuit, NP2 circuit, Narrow gap circuit, FUZZY control, SS Jump, Intelligent Digital Power Master (IDPM, optimum machining control), Lotus Leaf Texture (LLTX) glossy mirror-finish function	
	Power supply system	Compact, resistor-less, low-heat generation, power regenerating energy-saving method	
	Cooling system	Indirect cooling	
Control unit	Control unit	C31EA-2	
	Input method	Keyboard, USB flash memory, network	
	Pointing device	Touch panel, mouse	
	Display	15-in color TFT-LCD	
	Display characters	Alphanumeric characters	
	Number of control axes	Four axes (max.)	
	Setting (command) unit	XYZ…0.0001mm, C (rotary axis) …0.0001deg	
	Minimum drive unit	XYZ…0.0001mm, C (rotary axis) …0.0001deg	
	Manual feed	High-speed, low-speed, inching 0.001mm/0.01mm, extension mode (high-speed, low-speed), maximum feedrate: 7,000mm/min(XYZ)	

Control unit functions

NC functions	Thermal Buster (Thermal displacement correction system)	Electrode multiple misalignment correction (electrode rotation correction)
Year, month, date display	Program support function	Anti-virus protection
Chinese character display/input	Built-in scheduler	Maintenance functions
Character string replacement function	ESPER ADVANCE	Maintenance check
Learning function	ESPER ADVANCE PRO Lite	Alarm display (with troubleshooting guidance)
Machining start time designation function	ESPER ADVANCE variable supported	e-manual (electronic manual)
Various timers	Memory operation	Protection mode
Automatic return	Offset	Energy-saving function
Start point return	Coordinate value read/time read	Automatic positioning functions
Axis rotation	Workpiece coordinate system (106 coordinates)	Edge positioning
Machining functions	Coordinate rotation	Hole center positioning
FUZZY adaptive control	Figure rotation	Electrical-discharge positioning
Machining results graph, machining results table	Axis change	Width center positioning
Machining conditions expert	Mirror image	Slot center positioning
Master Pack	Scales for XY-axis	3-point center positioning
Orbit machining	Function computations	2 - 4 face positioning
Taper machining	Corner R command	Repeat positioning
Lateral machining	Corner chamfer command	Checking functions
Automatic coreless machining	Squareness command	Graphics (machining shape drawing)
3D machining	Backlash compensation	3D graphics check
Side servo machining	Pitch-error matrix compensation	3D viewer (Parasolid data display)
Offset machining	Pitch adjustment function	Single block
Inclined machining	Soft limit (inner and outer prohibited)	Dry run
Contour machining (spindle required)	Reference block	Block delete
C-axis machining (C-axis required)	Automatic zero point return	EPX format data read

Options

Options and retrofit specifications differ according to country and region; please contact a Mitsubishi Electric representative for details.

Main options correspondence table: ◎ Standard equipment, ○ Can be added after installation, ● Cannot be added after installation, × Not available

Model				EA8PSM	EA12PSM
Machine main unit	Lubricant	Automatic lubrication unit		◎	◎
	Scale	Scale feedback specifications	Z-axis	◎	◎
			XY-axis	◎	◎
	Thermal Buster (Thermal displacement correction system)			◎	◎
	Granite table*1			◎	×
	Advanced-function manual operation box			○	○
	LED light			○	○
Dielectric fluid system	Cooler	Dielectric fluid chiller unit (high-accuracy unit cooler)		●	●
	Fluid system	Dielectric fluid automatic supply/drain		◎	◎
		Automatic emission/suction changeover*2		◎	◎
		Program mable flushing nozzle (eight nozzles) + Automatic changeover		○	○
		Dielectric fluid distributor		○	○
		Fluid pressure three-level changeover		×	○
Power supply	Main power supply	FP80PS		◎	◎
		FP120PS		●	●
	Special power supply	SP power supply (exclusive for tungsten carbide machining)		●	●
		NP2 circuit		◎	◎
		Narrow gap circuit		◎	◎
		EDCoating		●	●

Model				EA8PSM	EA12PSM
Head-side tooling	High-rigidity C-axis*3			○	○
	High-accuracy built-in spindle*3			●	●
	Automatic clamp*3			○	○
	Removable holder (3R-16M-MACRO-R specifications)			○	○
	Large electrode adaptor			×	●*2
ATC	LS	10T	3R MACRO	○	○
			3R Combi	○	○
			EROWA ITS	○	○
		20T	3R MACRO	○	○
			3R Combi	○	○
			EROWA ITS	○	○
	MVH	20T	3R MACRO	○	○
			3R Combi	○	○
			EROWA ITS	○	○
		40T	3R MACRO	×	○
			3R Combi	×	○
			EROWA ITS	×	○
Control unit	Communication	External signal output (M code)		○	○
		External signal input/output (M code with answer)*4		○	○
		DNC H/W*5, S/W, FTP		◎	◎
		Robot interface specifications		○	○
Fine-hole jig specifications	Fine-hole jig specifications			●	●
	Ultrahigh-pressure fine-hole jig specifications			●	●
S/W	ESPERADVANCE PRO*6			○	○
	ESPERADVANCE PRO lite*6			◎	◎
	e-manual (electronic instruction manual)			◎	◎
	Built-in scheduler			◎	◎
	Anti-virus protection			◎	◎
	Power-saving function			◎	◎
Display	Run timer			○	○
	3-color warnig light			○	○
Miscellaneous	Instruction manual (paper edition)			○	○
Paint color designation				×	×

*1 Table height is 70mm (standard is 50mm), distance between table and electrode mounting surface is shortened by 20mm.
*2 Large-size electrode adapter can be installed only when high-accuracy built-in spindle is attached.
*3 Select the chuck from the following types. (3R-MACRO, 3R-Combi, EROWA-ITS50)
*4 External signal output (M code with answer) is necessary for attaching external equipment that requires an answer signal.
*5 LAN cables should all be straight wiring with shielding connector, Category 5 (100BASE-TX compliant), STP (four-shielded twisted-pair). A switchable hub capable of supporting shielded LAN cables should be used.
*6 Proprietary personal computer is to be acquired separately.

Network Connection Specifications (FTP and DNC S/W)

Data such as NC programs, machining conditions and variables can be exchanged between a personal computer and EDM.
One IP address must be prepared for each EDM within the user's in-house network.

Required specifications	Image		Remarks
Operate on the EDM side, and receive data from personal computer	Data transmission	Standard (DNC H/W)	Uses Explorer on EDM side and receives data to common HDD on the EDM side. After that, data I/O operation is required.
Operate on the EDM side, and send data directly to the EDM's NC	Data transmission	Standard (FTP)	Data can only be received via data I/O operation.
Operate on the personal computer side, and send data to the EDM	Data transmission	Standard (DNC H/W)	Uses Explorer on personal computer-side and common HDD on EDM-side. After that, data I/O operation is required for the EDM.
Operate on the personal computer side, and send data directly to the EDM's NC	Data transmission	Standard (DNC S/W)	Commercially available DNC software must be installed on the personal computer-side. Refer to DNC specifications documentation for details.

Power Facilities Capacity

Model	EA8PSM		EA12PSM	
Power supply	FP80PS	FP120PS	FP80PS	FP120PS
Maximum machining current average[A]	60	100	60	100
Maximum machining current peak[A]	80	120	80	120
Dielectric fluid chiller unit[kW]	1.74	3.5	1.74	3.5
Total input capacity[kVA]*1	6.5	9.5	7.0	10.0
Machine-generated heat value[kW]*2, 3	3.9	5.7	4.2	6.0

*1 Please add 5[kVA] for total input capacity with SP power supply specifications.
*2 Reference value (heat value (kW) = Total input capacity (kVA) × 0.6)
*3 Please add 3[kW] for machine-generated heat value with SP power supply specifications.

Head-side tooling

* Tooling should be selected

Removable holder

3R-16M-MACRO-R specifications

Automatic clamp

Clamp spindle side holder with air chuck
(photo shows EROWA-ITS chuck specifications)

High-rigidity C-axis

Supports parallel electrode setup and index machining
Supports fluid emission from spindle center
(photo shows 3R-MACRO chuck specifications)

ATC

LS-10T(automatic tool changer)

Change up to 10 electrodes
Supports continuous machining using many electrodes

LS-20T(automatic tool changer)

Change up to 20 electrodes
Supports continuous machining using many electrodes

MVH-20T/40T(automatic tool changer)

Change up to 20/40 electrodes
Supports continuous machining using many electrodes

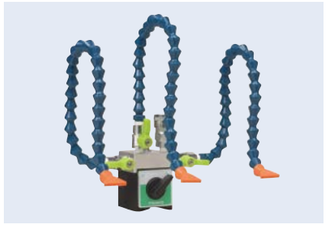
Dielectric fluid system, Etc.

Fine-hole jig specifications/ High-pressure fine-hole jig specifications

Supports fine-hole machining, and fine-hole jig is removable

Dielectric fluid distributor

Sprays dielectric fluid between the workpiece and electrode during pitch machining



Distributes dielectric fluid into three flows and sprays onto the machining section

LED light

Power-supply specifications for LED light require DC24V.

Advanced-function manual operation box

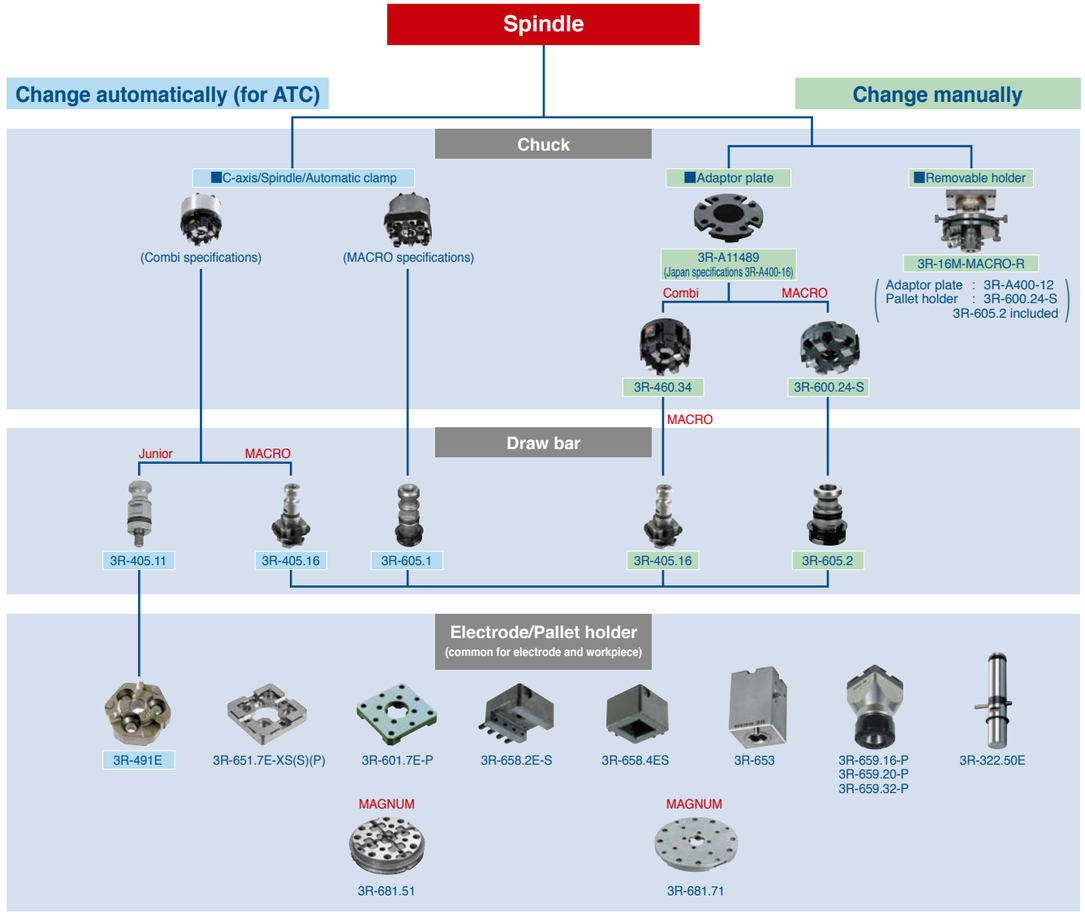
Standard manual operation box

LCD display improves workability
Workpiece coordinates can be set from the manual operation box
The jog feed rate can be changed between 50 and 150% using the override function

Specifications are subject to change without notice, and appearance may be different from the photo.

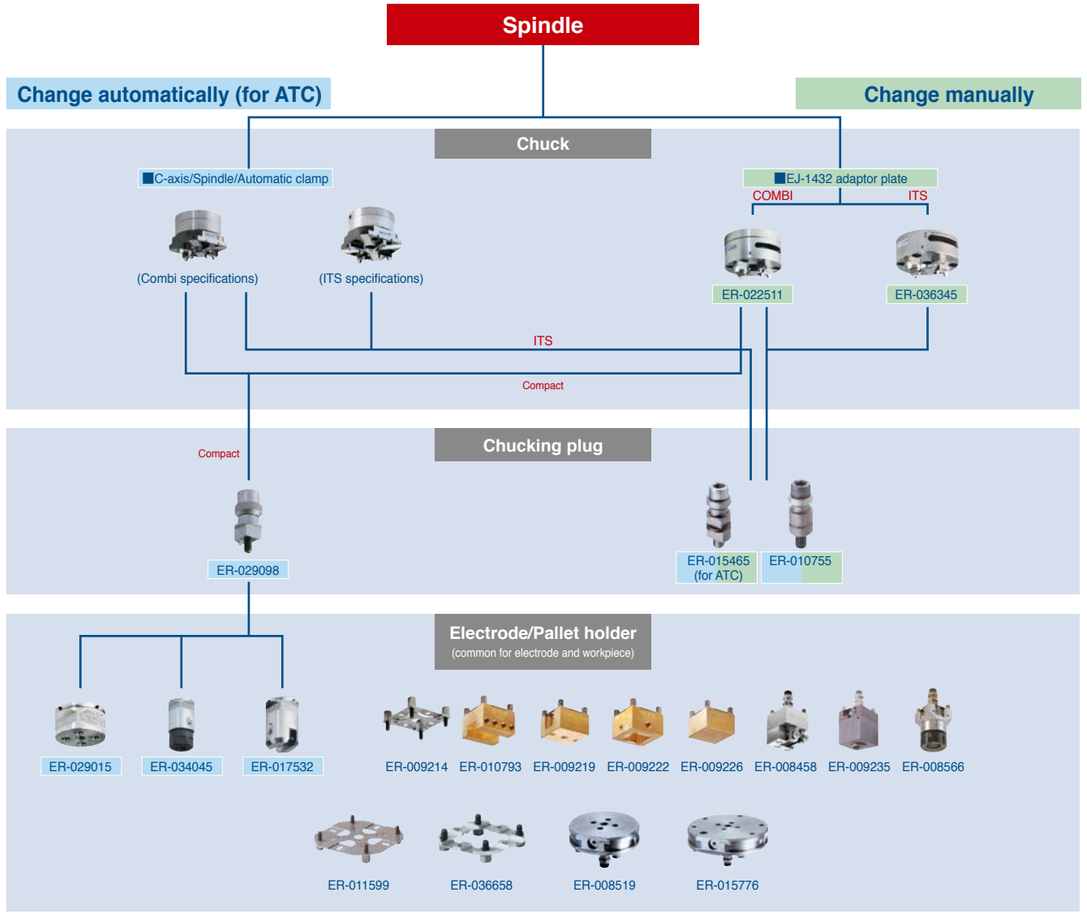
Tooling

System 3R System Chart



* Please contact System 3R Co., Ltd. for detailed tooling specifications.

EROWA System Chart



* Please contact EROWA Japan Co., Ltd. for detailed tooling specifications.

Preparation for Machine Installation/Cautions

Preparation for Machine Installation

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 tooling and electrode

It normally takes one to two months for tooling delivery, so please place orders as early as possible

1) Determination of tooling and electrode	
2) Order, preparation or manufacture	

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) 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 line-up 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.

File applications to fire department

The applications must be filed before the EDM is installed.

1) Confirm the dielectric fluid amount	
2) File applications to fire department (EDMs already installed must also be filed.)	
·Application for "Facility using fire" (fluid amount less than 400ℓ)	
·Application for "Low volume hazardous material storage and handling site" (fluid amount more than 400ℓ and less than 2,000ℓ)	
·Application for "General handling site" (fluid amount 2,000ℓ or more)	

The required applications differ according to country and region; please contact your nearest fire department for details.

Oil for EDMs

Always use dielectric fluid which has a flash point of 70°C or more.
Prepare the following dielectric fluid when operating the EDMs.

■Dielectric fluid example <JX Nippon Oil & Energy Metal Work EDF-K2>

Table of dielectric fluid properties

Item \ Product brand	Metal Work EDF-K2
Density g/cm³ (@15℃)	0.770
Flash point ℃ (PM)	93
Kinematic viscosity mm²/s (@40℃)	2.2
Appearance	Clear and colorless

*Please contact the manufacturer for the Material Safety Data Sheet (SDS/MSDS).

■Dielectric fluid example (Showa Shell Sekiyu Shell Paraol 250)

Table of dielectric fluid properties

Item \ Product brand	Shell Paraol 250
Density g/cm³ (@15℃)	0.797
Flash point ℃ (PM)	92
Kinematic viscosity mm²/s (@40℃)	2.42
Appearance	Clear and colorless

*Please contact the manufacturer for the Material Safety Data Sheet (SDS/MSDS).

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.
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 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
EA8S/12S, EA28V ADVANCE, EA40/50 ADVANCE specification
· Select a floor where vibration or impact will not be conveyed.
· As a reference, the vibration level should have a max. amplitude of 5μm or less at a 10 to 20Hz frequency.
MA2000, EA8PS, EA12PS
· 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.
④Room construction
· The room where the EDM is to be installed must be a non-flammable or fire-proof structure. Please contact your local fire department for details.
⑤Ventilation of combustible vapors
· Install a ventilator to effectively remove combustible vapors and fine powders.

2. Machine heating value

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

Heating value (kW)
= Equipment capacity (kVA) x 0.6
Example: For EA12PS + FP80PS, 7.0kVA x 0.6 = 4.2kW

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

3. Power-supply equipment

• Primary wiring
Normal machining : 3-phase 200/220VAC±10% 60Hz, 3-phase 200VAC±10% 50Hz
High-accuracy machining : 3-phase 200/220VAC±4% 60Hz, 3-phase 200VAC±4% 50Hz
An automatic voltage regulator (AVR) should be used if voltage fluctuations exceed that value above
Do not power on in instantaneous power failure occurrence that exceeds 20msec.
A single-phase AC night power source for the automatic fire extinguisher : 100VAC±10%(50/60Hz)
• Power capacity
Facility capacity [kVA] = Total power input (Machine input + power supply input + dielectric fluid chiller unit input) [kVA]
Refer to page 21 for details on the machine, power supply and dielectric fluid chiller unit
• No-fuse breaker and earth-leakage breaker
When selecting a no-fuse breaker or earth-leakage breaker for the primary side of the EDM, calculate the total facility capacity, and select the breaker using the following table as a reference.

Total facility capacity [kVA]	No-fuse breaker	Earth-leakage breaker
~12	NF50-CV(50A)	NV50-CV(50A)
12~22	NF100-CV(100A)	NV100-CV(100A)
22~33	NF225-CV(150A)	NV225-CV(150A)

The breakers in the table allow for the rush current of the transformer in the power supply panel.
• Selecting the power input cable size
The following table is a guide for calculating the appropriate power cable size to use based on total capacity. The cable size should be sufficient to allow some leeway.

Total facility capacity [kVA]	Cable size [mm²]
~9	5.5
9~12	8.0
12~15	14.0

Total facility capacity [kVA]	Cable size [mm²]
15~21	22.0
21~28	30.0

4. Grounding work

The EDMs must always be grounded to prevent external noise, radio disturbance and earth leakage.
Install a 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.

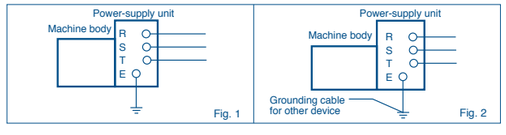


Fig. 1

Fig. 2

5. Primary air equipment

The standard EA12PS specifications do not require an air source, but an air supply must be prepared when using the optional high-accuracy built-in C-axis etc.
· Hose diameter : 1/4 hose (hose sleeve outer diameter: φ9.0 (0.35"))
· Pressure : 0.5 to 0.7MPa (72.5 to 101.5psi)
(0.6MPa (87) or more when using EROWA tooling specifications)
· Flow rate : 27ℓ/min or more (2.65cu.ft./min.)

6. Shield room

Install a shield room if the EDM affects televisions or other communication facilities in the area. Observe the following points when installing the EDM in the shield room.
1. Ground the EDM in the shield room (Fig. 3).
2. If the EDM cannot be grounded in the shield room, connect the 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.

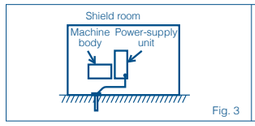


Fig. 3

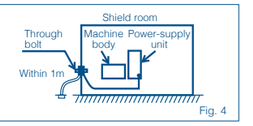


Fig. 4

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 EDM. Class C grounding (grounding resistance of 10Ω or less) is recommended for the 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 R407C or R410A (for booster power). Please use only the specified refrigerant (R407C or 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, 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 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.

Recommended sliding surface lubricants

Use the following lubricant for sliding surface

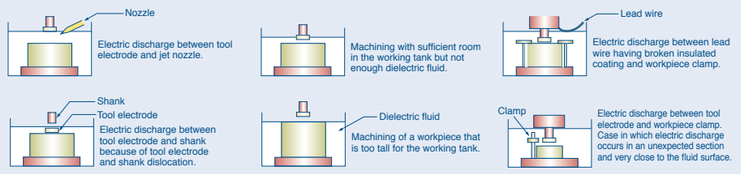
As of March 2014

Manufacturer	Product name
Exxon Mobil	Mobil DTE26

Cautions

Preventing fires and accidents with EDMs

Never attempt the following operation methods. These are extremely hazardous.



- Ensure that the upper part of the workpiece is submerged by 50mm (1.97in) or more (FP60EA, FP60MA, FP80V) or 100mm (3.94in) or more (FP100EA, FP120V) from the surface of the dielectric fluid
- Never conduct spray machining as there is a risk of fire
- Do not use equipment that produces heat or sparks such as heating systems, welding machines, or grinding machinery near the EDM
- Always keep the area clean and tidy, and do not store flammable materials near the EDM
- Install an extra fire extinguisher in addition to the automatic fire extinguisher enclosed with the EDM
- Ensure that the area is sufficiently ventilated
- Monitoring automatic operation : For safety purposes, make sure an operator is always present during operation, even if various safety devices are equipped, so that appropriate actions can be taken

Safety measures

A dielectric fluid temperature detector, fluid level detector, abnormal machining detector and automatic fire extinguisher, standard equipment, and a flame-resistant metal hose is used. A tank which has passed the type test of electrical-discharge machine of Hazardous Materials Safety Techniques Association is used (for tank capacities less than 2,000ℓ, tanks which have passed a voluntary water leakage test). Note that the safety devices must be periodically inspected. Refer to the instruction manual (safety manual) when using the EDM.

Automatic fire extinguisher

When heat is detected, a light-water solution is automatically sprayed to extinguish the fire. Machining also stops automatically at this time.
A separate 100VAC power supply is required for the automatic fire extinguisher.

Dielectric fluid temperature and fluid level detector

Machining is automatically stopped when the dielectric fluid temperature reaches approx.
60℃, or when the fluid level drops during machining.

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 lighting, 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. 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.

MEMO

EA-PS Series

FA Machinery and Automation Products Global Production Bases

①Nagoya Works
Programmable controllers, display panels (HMI), AC servos, inverters, industrial robots, CNCs for power distribution transformers, EDMs, laser processing machines

②Kani Factory
Electromagnetic switchgear

③Shinshiro Factory
3-phase motors, IPM motors

④Fukuyama Works
Power management meters, energy-saving UPS support devices, low-voltage circuit breakers

⑤Nagatsugawa Works
Pressurized ventilators

⑥Power Distribution Systems Center
High-voltage circuit breakers, high-voltage electromagnetic contactors

⑦Mitsubishi Electric Factory Industrial Products Corporation
Geared motors

⑧Tada Electric Co., Ltd.
Electron-beam processing machines

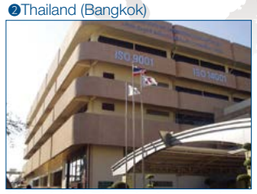
❺China (Dalian)

Mitsubishi Electric Dalian Industrial Products Co., Ltd.
Inverters, low-voltage circuit breakers, electromagnetic switchgear EDMs, laser processing machines

❶India (Pune)

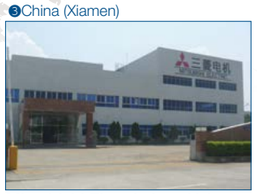
Mitsubishi Electric India Pvt. Ltd.
Inverters

❷Thailand (Bangkok)



Mitsubishi Electric Automation (Thailand) Co., Ltd.
3-phase motors

❸China (Xiamen)



Mitsubishi Electric Low Voltage Equipment (Xiamen) Co., Ltd.
Low-voltage circuit breakers

❹China (Changshu)

Mitsubishi Electric Automation Manufacturing (ChangShu) Co., Ltd.
Programmable controllers, display panels (HMI), AC servo CNCs

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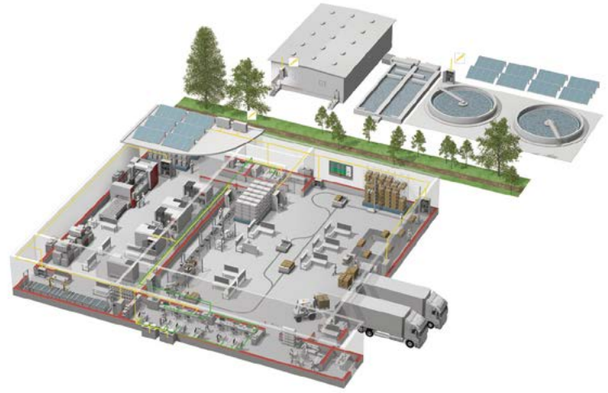


Mitsubishi Electric offers a wide range of automation equipment from PLCs and HMIs to CNC and EDM machines.

A NAME TO TRUST

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

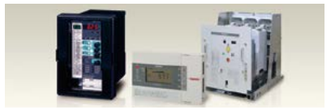
The Mitsubishi brand name is recognized around the world as a symbol of premium quality.

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

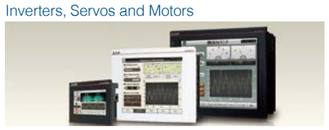


Medium voltage: VCB, VCC

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.

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