Changes for the Better





# **MITSUBISHI WIRE EDM**

Mitsubishi Electric Corporation Nagoya Works is a factory certified for ISO14001 (standards for environmental management systems) and ISO9001(standards for quality assurance management systems)







for a greener tomorrow







**Refining high accuracy and high speed** together with outstanding operability

# **FA Advance Series Evolution Advances EDM's DNA**

The DNA of the Mitsubishi Wire EDM's have evolved into the leader of today's market place. This new EDM line-up pursues the best of high cutting speed and high accuracy with a powerful new control that makes easy access to this ultimate performance.

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# Speed



# High-performance EDM

# FA20S Advance







# Providing the power for high-speed, high-accuracy machining of large workpieces

FA30V ADVANCE (Z600 specifications) X: 750(29.5) Y: 500(19.6) Z: 420(16.5) 1300(51.1)×1000(39.3)×605(23.8)

# FA50VM



Stroke(mm)(in) Max. workpiece dimensions(mm)(i Max. workpiece weight(kg)(lb.) Wire electrode diameter(mm)(in)

X: 1300(51.1) Y: 1000(39.3) Z: 400(15.7) 2000(78.7)×1600(62.9)×395(15.5) 4000 0.2 to 0.36(.008 to .014)

Machining Samples Product Introduction Control Unit Machining Power Supply Mac ning Adaptive Contr Mech nsir Options Supply/Control Spec Machine Installation

uct Line-up

# **FA-S** Advance



# **High-accuracy fit machining**

Model	FA10S Advance
Function used	PF circuit
Electrode material	ø0.2(.008")/BS
Workpiece	STEEL (PD613)
Workpiece thickness	60mm(2.4")
Surface roughness	Rz3.8μm (150μ"Rz) / Ra0.47μm (19μ"Ra)

High-accuracy machining with a surface roughness of Rz3.8µm (3 cuts technology).

- A highly accurate fit with a straightness and shape accuracy of ±3µm (.00012") or less is possible.

# **High-accuracy stepped machining**

Model	FA10S Advance	
Function used	PM5, SL control	
Electrode material	ø0.2(.008")/BS	
Workpiece	STEEL (SKD11)	
Workpiece thickness	5 to 50mm(0.2 to 2.0")	
Surface roughness	Rz2.7µm (106µ"Rz) / Ra0.34µm (13µ"Ra)	

- High-accuracy machining with a straightness of 2µm (.00008") or less is possible even with workpieces of varying thicknesses.

- Special machining acknowledgement is not required when using PM5 or SL control.

# Wide-angle taper machining

Model	FA20S Advance
Function used	Angle Master
Electrode material	ø0.25(.010")/MEGA-T
Workpiece	STEEL (SKD61)
Workpiece thickness	50mm(2.0")
Surface roughness	Rz5.0µm (197µ"Rz)/ Ra0.63µm (25µ"Ra)

Wide Angle taper machining with an angle of up to 45° is possible using the Angle Master option.

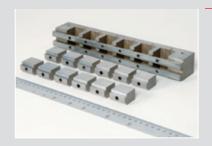
- New guide design reduces wire curl producing a smooth even surface.

# High-speed machining through drilled holes

Model	FA20S Advance	
Function used	3D-PM	
Electrode material	ø0.2(.008")/BS	
Workpiece	STEEL (SKD11)	
Workpiece thickness	60mm(2.4")	
Surface roughness	Rz4.0μm (157μ"Rz) / Ra0.5μm (20μ"Ra)	

- The drilled hole section is automatically recognized from the 3D model. It prevents wire breakage and enables high-speed machining.

- Transition lines where the workpiece thickness changes are dramatically reduced, achieving a uniform machining surface.



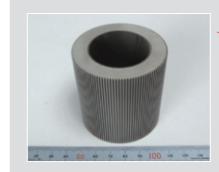
# High-speed stepped shape machining

Model	FA10S Advance
Function used	3D-PM
Electrode material	ø0.2(.008")/BS
Workpiece	STEEL (S45C)
Workpiece thickness	20mm(0.8")×2 pieces stacked
Surface roughness	Rz12.0µm (472µ"Rz) / Ra1.5µm (59µ"Ra)

- The features of the machined shape are automatically evaluated from a 3D model.

The machining conditions are optimized according to the workpiece thickness which greatly improves the actual machining time. (in-house comparison 20%).

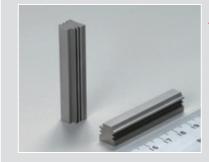
# FA-S Advance / FA-V



### High-accuracy gear machining Model FA20S Adv Function used CM control Electrode ø0.15 (.00 material STEEL(SK Workpiece Workpiece 60mm (2. thickness Rz2.5µm Surface Ra0.32µm roughness

# **Tight Clearance machining of thick workpieces**

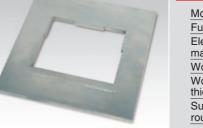
-	
Model	FA20S Advance
Function used	HL circuit
Electrode material	ø0.25 (.010")/BS
Workpiece	STEEL (SKD11)
Workpiece thickness	Punch side 150m Die side 100mm (
Surface roughness	Rz2.5µm (98µ"Rz Ra0.32µm (13µ"F



### **High-accuracy punch machining** FA10S Adv Model Function used PF circuit Electrode ø0.25 (.01 material STEEL (SH Workpiece Workpiece 50mm (2. thickness Rz2.5µm

Surface

roughness



odel	FA30V Advance		
unction used	V500 power supply		
ectrode aterial	ø0.3(.012")/BS		
orkpiece	STEEL (SKD11)		
orkpiece ickness	30mm(1.2")		
urface ughness	Rz6.0μm (236μ"Rz) / Ra0.75μm (30μ"Ra)		

Ra0.32µm

# Thick workpiece slider rail machining

Model	FA30V Adva
Function used	V500 power
Electrode material	ø0.3(.012")/
Workpiece	STEEL (SKI
Workpiece thickness	300mm <mark>(11.8</mark>
Surface roughness	Rz6.0µm (2) Ra0.75µm (

\* The listed machining results are all based on in-house conditions and measurements. (Note) JIS B0601: '01 and ISO 4287: '97/ISO 1302: '02 compliant (Rz ≒ conventional notation Ry)

(Note) JIS B0601: '01 and ISO 4287: '97/ISO 1302: '02 compliant (Rz ≒ conventional notation Ry)

\* The listed machining results are all based on in-house conditions and measurements

# oduct Line--up

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ance	-
6")/BS	
(D11)	
")	
98µ"Rz) / (13µ"Ra)	

High-accuracy machining is possible by using Mitsubishi's original Corner Master Control which improves shape accuracy by reducing wire lag in the corners.

- The HL circuit suppresses wire vibration (barrel shaping) producing a wall straightness of 3µm (.00012") or less.

- This is perfect for producing high-accuracy stamping and fine blanking die type work.

vance
)")/BS
(D11)
")
98µ"Rz) / (13µ"Ra)

- The PF circuit enables Fine Finish machining of a Rz2.5µm (.0001") or less surface roughness.

# Large frame (X500mm(19.7") × Y400mm(15.7")) machining

- The standard linear scale enables high-accuracy machining realizing a pitch accuracy and shape accuracy of ±5µm (.0002") or less even with large-scale EDMs.

- Suitable for machining large dies for automobiles or large-screen televisions.

ance supply

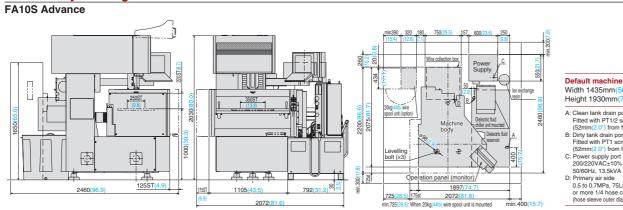
- /BS (D11)
- 36µ"Rz) / 30µ"Ra)
- The V500 power supply greatly improves the machining speed in thick workpiece areas.
- The total machining speed is improved by up to 30% compared to conventional models when machining workpieces which are 150mm (5.9") or thicker.

# Global standard machine for realizing high performance & cost efficiency

# FA10S Advance



# **Outline/Layout diagrams**



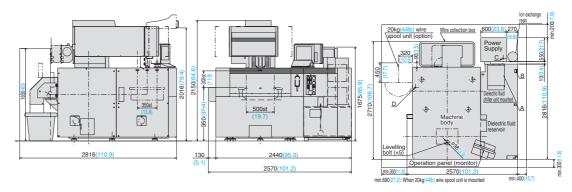
# Default machine dimension Width 1435mm(56.5") Height 1930mm(76.0") A: Clean tank drain pot A: Clean tank drain pot (52mm(2.0°) from floor) E: Dirty tank drain pot Fitted with PT1 2 screw valve (52mm(2.0°) from floor) C: Power supply pot 200/220VAC=10% 50/60Hz, 13.5kVA D: Primary air side 0.5 to 0.7MPa, 75L/min(2.6cu.ft/min) or more 1/4 hose connection (hose sleeve outer diameter.a9mm(35°))

Unit:mm (in

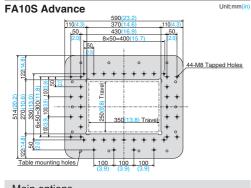
# FA20S Advance



**Outline/Layout diagrams** FA20S Advance



### **Table diagram**

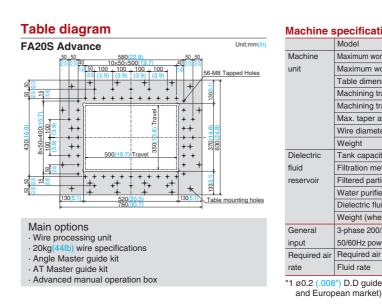


Main options Wire processing unit
 20kg(44lb) wire specifications · Angle Master guide kit · AT Master guide kit · Advanced manual operation box

### Machine specifications (standard specifications)

	· · · · · · · · · · · · · · · · · · ·		
	Model		FA10S ADVANCE
Machine	Maximum workpiece dimensions (W×D	×H) [mm] <mark>(in)</mark>	800(31.5)×600(23.6)×215(8.5)
unit	Maximum workpiece weight	[kg] <mark>(lb)</mark>	500(1100)
	Table dimensions	[mm] <mark>(in)</mark>	590(23.2)×514(20.2)
	Machining travel (X×Y×Z)	[mm] <mark>(in)</mark>	350(13.8)×250(9.8)×220(8.7)
	Machining travel (U×V)	[mm] <mark>(in)</mark>	±32(1.3)×±32(1.3)
	Max. taper angle	[°]	15 (with 100mm(3.9") workpiece thickness)
	Wire diameter	[mm] <mark>(in)</mark>	0.1(.004) to 0.3(.012) *1
	Weight	[kg] <mark>(lb)</mark>	2000(4400)
Dielectric	Tank capacity	[ <i>ℓ</i> ](US gal)	440(116)
fluid	Filtration method		Paper filter (two)
reservoir	Filtered particle size	[µm]	3
	Water purifier (Ion exchange resin)	[ℓ] <mark>(cu.ft.)</mark>	10(0.35)
	Dielectric fluid chiller unit		Unit cooler
	Weight (when dry)	[kg] <mark>(lb)</mark>	280(617)
General	3-phase 200/220 AC ±10%	[].) (A]	10 5
input	50/60Hz power factor 0.9	[kVA]	13.5
Required air	Required air rate	[Mpa] <mark>(psi)</mark>	0.5 to 0.7(70 to 100)
rate	Fluid rate [	ℓ (cu.ft.)/min]	75(2.6) or more

\*1 Ø0.2 (.008") D.D guides come as standard. (Ø0.25 (.010") D.D guides come as standard for the USA and European market)





Unit:mm(in)

### Default machine dimensions Width 1900mm(74.8") Height 2100mm(82.7")

- A: Clean tank drain port Fitted with PT1/2 screw valve (52mm(2.0°) from floor) B: Dirty tank drain port Fitted with PT1 screw valve (52mm(2.0°) from floor) C: Power supply port 200/220VAC=10% 50/60H2; 13.5KVA D: Primary air side 0.5 to 0.7MP4, 75L/min(2.6cu.tl/min) or more 1/4 hose connection (hose sleeve outer diameter: o9mm(.35°))

# Machine specifications (standard specifications)

		FA20S ADVANCE
workpiece dimensions (W×D×F	l) [mm] <mark>(in)</mark>	1050(41.3)×800(31.5)×295(11.6)
m workpiece weight	[kg] <mark>(lb)</mark>	1500(3300)
mensions	[mm] <mark>(in)</mark>	780(30.7)×630(24.8)
ng travel (X×Y×Z)	[mm] <mark>(in)</mark>	500(19.7)×350(13.8)×300(11.8)
ng travel (U×V)	[mm] <mark>(in)</mark>	±75(3.0)×±75(3.0)
er angle	[°]	15 (with 260mm(10.2") workpiece thickness)
meter	[mm] <mark>(in)</mark>	0.1(.004) to 0.3(.012)*1
	[kg] <mark>(lb)</mark>	3500(7716)
pacity [	ℓ](US gal)	740(195)
method		Paper filter (two)
particle size	[µm]	3
urifier (Ion exchange resin)	[ ℓ ](cu.ft.)	10(0.35)
c fluid chiller unit		Unit cooler
when dry)	[kg] <mark>(lb)</mark>	350(771)
200/220 AC ±10%	[kVA]	13.5
power factor 0.9	[KVA]	13.5
d air rate	[Mpa](psi)	0.5 to 0.7(70 to 100)
e [l	<mark>cu.ft.)</mark> /min]	75(2.6) or more

\*1 Ø0.2 (.008") D.D guides come as standard. (Ø0.25 (.010") D.D guides come as standard for the USA

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Options

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Product Line-up

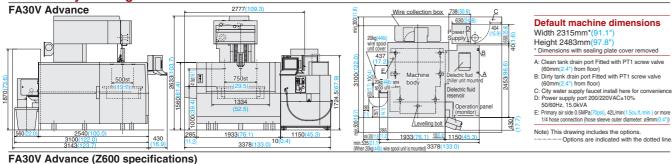
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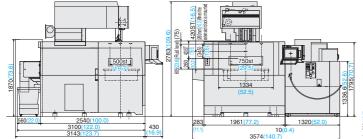
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# FA30V Advance / FA30V Advance (Z600 specifications)

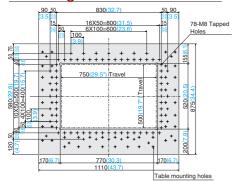


# **Outline/Layout diagrams**





### **Table diagram**



### Main options Wire processing unit 20kg(44lb) wire spool unit specifications 50kg(11 b) wire spool unit specifications 4-piece filter specifications Advanced manual operation box

1795(70,77)	nin.500(19.7) 3100(122.0) min.300(1.8)	Wire collection box	788 33.8 2022 8 Power D Supply Detectic fuid chile unt mounted Detectric fuid reservoir 1320(52,0)		430 3143(123.7) 40(1.6) (17.7)	Default machine dimensions Width 2430mm*(95.7*) Height 2683mm(105.6*) Dimensions with sealing plate cover removed A: Clean tank drain port Fitted with PT1 screw valve (60mm(2.4*) from floor) B: Dirty tank drain port Fitted with PT1 screw valve (60mm(2.4*) from floor) C: City water supply faucet install here for convenience D: Power supply port 200/220VAc210% S0(60Hz, 15.0KVA E: Primary air side (5MPAr(pps), 42/Imin(15.0t.Rimin) or more 1/4 hose conrection (hose sleve outer diameter s8mm(0.4*)) Note) This drawing includes the options.
	(WP	min.535(21.1) / Levelling bolt 1 en 20kg(44b) wire spool (0.1)			tor)	

### Machine specifications (standard specifications)

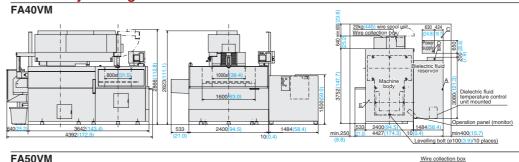
			,	
	Model		FA30V ADVANCE	FA30V ADVANCE (Z600 specifications)
Machine	Maximum workpiece dimensions (W	«DxH) [mm] <mark>(in)</mark>	1300(51.2)×1000(39.4)×405(15.9)	1300(51.2)×1000(39.4)×605(23.8)
unit	Maximum workpiece weight	t [kg](lb)	3000(6613)	3000(6613)
	Table dimensions	[mm] <mark>(in)</mark>	1100(43.3)×875(34.4)	1100(43.3)×875(34.4)
	Machining travel (X×Y×Z)	[mm] <mark>(in)</mark>	750(29.5)×500(19.7)×410(16.1)	750(29.5)×500(19.7)×420(16.5)
	Machining travel (U×V)	[mm] <mark>(in)</mark>	±100(±3.9)×±100(±3.9)	±100(±3.9)×±100(±3.9)
	Max. taper angle	[°]	15 (with 355mm(14.0") workpiece thickness)	15°/355mm(14.0")
	Wire diameter	[mm] <mark>(in)</mark>	0.2(.008) to 0.3(.012) *1	0.2(.008) to 0.3(.012) *1
	Weight	[kg] <mark>(lb)</mark>	5000(11000)	5700(12566)
Dielectric	Tank capacity	[ ℓ ](US gal)	1360(359)	1700(449)
fluid reservoir	Filtration method		Paper filter (four)	Paper filter (four)
	Filtered particle size	[µm]	3	3
	Water purifier (Ion exchange re	esin) [ ℓ ] <mark>(cu.ft.)</mark>	20(0.7)	20(0.7)
	Dielectric fluid chiller unit		Unit cooler	Unit cooler
	Weight (when dry)	[kg] <mark>(lb)</mark>	550(1210)	580(1278)
General	3-phase 200/220 AC±10%	[kVA]	15.0	15.0
input	50/60Hz power factor 0.9	[((),()	13.0	13.0
Required air	Required air rate	[Mpa] <mark>(psi)</mark>	0.5 to 0.7(70 to 100)	0.5 to 0.7(70 to 100)
rate	Fluid rate	[ <b>ℓ</b> (cu.ft.)/min]	42(1.5) or more	42(1.5) or more
1 ø0.2 (.008	") D.D guides come as sta	ndard, (ø0.25	(.010") D.D guides come as st	tandard for the USA

rd. (ø0.25 (.010°) D.D gi and European market)

# **FA40VM / FA50VM**

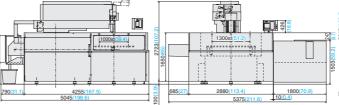


# **Outline/Layout diagrams**

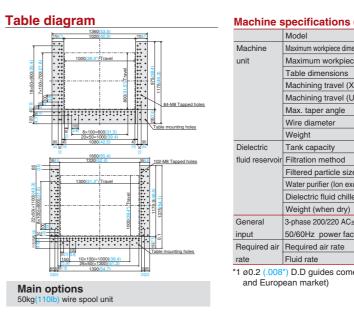


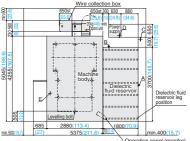


sions with sealing plate cover removed



ð







### Default machine dimensions Width 2490mm\*(98.

Height 2723mm(107.2")

- \* Dimensions with sealing plate cover removed
- Dimensions with searing place Cover removed A: Clean tank drain port Fitted with PT1 screw valve (60mm)(2.4°) from floor) B: Dirty tank drain port Fitted with PT1 screw valve (60mm)(2.4°) from floor) C: City water supply flaucet install here for convenience D: Power supply port 2002/2004/Ce10% S0/60Hz, 17.5KVA E: Primay air aide SJMBa70pol, 42Umin(1.5cutUmin,) or more 1/4 hose connection (hose sleeve outer diameter: e9mm)(J4°))

### **Default machine dimensions** Width 2985mm\*(117.5")

Height 2723mm(107.2"

- sions with sealing plate cove A: Clean tank drain port Fitted with PT1 screw valve
- A: Clean tank drain port Hited with P11 screw valve (60mn)(24) from floor)
  B: Dirty tank drain port Fitted with PT1 screw valve (60mn)(24) from floor)
  C: City water supply faucet install here for convenience D: Power supply port 200/2200/AC:10% S0/60Hz, 19KVA
  E: Primary air side (SJNB47/058), 42L/min(1.Soutt.Imis,) or more 1/4 hose connection (hose sleeve outer diameter: o#mm(0.4°))

### Machine specifications (standard specifications)

(standard sp	becili	cations)	
		FA40VM	FA50VM
ensions (W×D×H) [mi	m] <mark>(in)</mark>	1550(61.0)×1300(51.2)×395(15.6)	2000(78.7)×1600(63.0)×395(15.6)
ce weight [k	(g] <mark>(lb)</mark>	4000(8818)	4000(8818)
[mi	m] <mark>(in)</mark>	1360(53.5)×1175(46.3)	1660(65.4)×1375(54.1)
(xYxZ) [mi	m] <mark>(in)</mark>	1000(39.4)×800(31.5)×400(15.7)	1300(51.2)×1000(39.4)×400(15.7)
J×V) [mi	m] <mark>(in)</mark>	±75(±3.0)×±75(±3.0)	±75(±3.0)×±75(±3.0)
	[°]	15 (with 260mm(10.2") workpiece thickness)	15 (with 260mm(10.2*) workpiece thickness)
[mi	m] <mark>(in)</mark>	0.2(.008) to 0.36(.014) (0.36(.014): AT impossible) *1	0.2(.008) to 0.36(.014) (0.36(.014): AT impossible) *1
[k	( <mark>lb)</mark>	11000(24200)	10000(22000)
[ L ] <mark>(U</mark>	S gal)	2425(640)	3200(845)
		Paper filter (four)	Paper filter (four)
ze	[µm]	3	3
kchange resin) [ l ]	cu.ft.)	20(0.7)	20(0.7)
ler unit		Unit cooler	Unit cooler
[k	(g] <mark>(lb)</mark>	680(1500)	1000(2205)
±10%	[kVA]	17.5	19.0
ctor 0.9	[K v A]	17.5	19.0
[Mpa	a] <mark>(psi)</mark>	0.5 to 0.7(70 to 100)	0.5 to 0.7(70 to 100)
[ℓ(cu.ft.)	/min]	42(1.5) or more	42(1.5) or more
a an atomaland (a	-0.05		and and faither LICA

\*1 Ø0.2 (.008") D.D guides come as standard. (Ø0.25 (.010") D.D guides come as standard for the USA

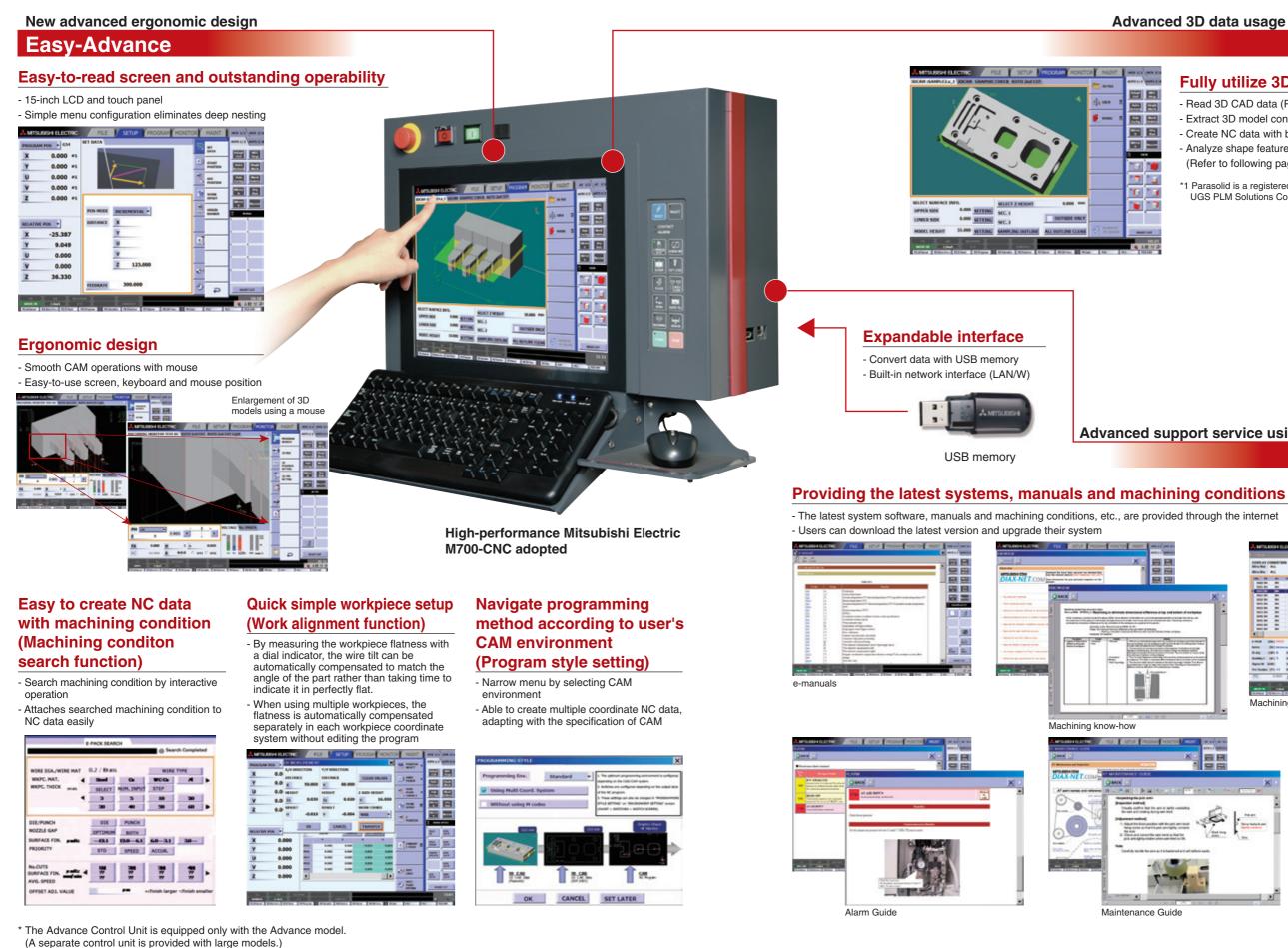
Product Line

-up

Control Unit

Powe

# Advance Control Unit Now providing 3 new advance functions



# Advanced 3D data usage at the machine control **3D-Advance**



# Fully utilize 3D CAD data

- Read 3D CAD data (Parasolid format\*1)
- Extract 3D model contours
- Create NC data with built-in 2D CAM
- Analyze shape features to improve machining performance (Refer to following page for details)
- \*1 Parasolid is a registered trademark of UGS PLM Solutions Co., Ltd.

# Advanced support service using Internet technology Net-Advance

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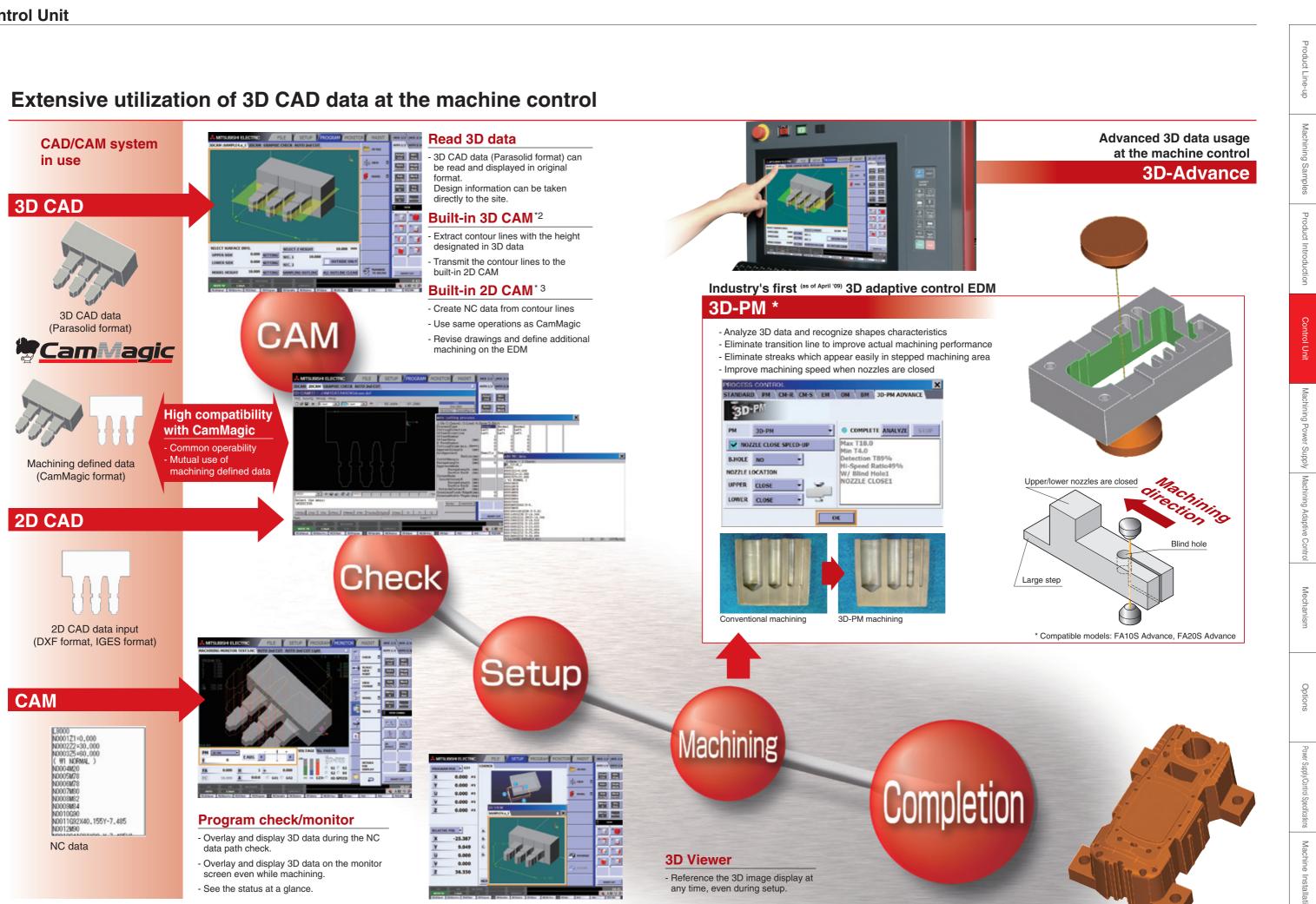


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Mechanism



\* Parasolid is a registered trademark of UGS PLM Solutions Co., Ltd.

\*1 Advance Control Unit is equipped only with the Advance model. (A separate control unit is provided with large models.)

\*2 This is not a function to create or edit the 3D model.

\*3 The 2D CAM is based on the CamMagicW, but is limited to basic 2D CAM functions.

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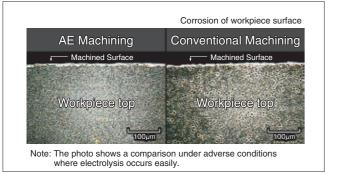
# Machining Power Supply Various power supply control technologies provide high accuracy

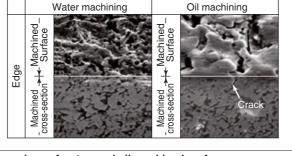
# High-speed Anti-electrolysis power supply (AE power supply)

- Electrolytic corrosion is suppressed to prevent the formation of softened layers

- AE power supply is used for all power circuits from rough machining to finish machining

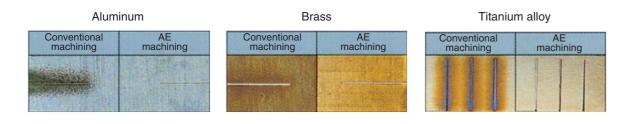
- High-speed, safe unmanned machining possible using water





Comparison of AE and conventional machining

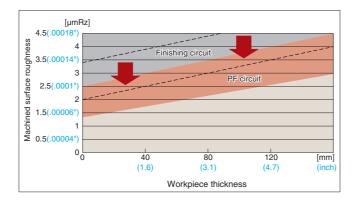
Comparison of water- and oil-machined surfaces



Oxidization of workpiece surface

# Fine finish circuit (PF circuit)\*

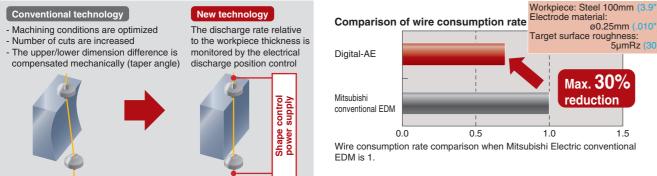
- Machine with workpiece directly set on table (insulate jig not required)
- Machining range not limited (entire XY stroke area)
- Achieves both surface roughness and straightness accuracy - Extends die life and improves die release properties
- \* Compatible model: FA10S Advance, FA20S Advance FA30V Advance



# Shape control power supply Digital-AE<sup>\*2</sup>

### Reduction of wire consumption rate

- Maintains high straightness accuracy even when the wire speed is kept low in order to reduce wire consumption



Examples of PM

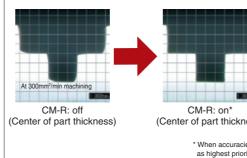


- Machine without changing program corner radius size or feedrate

# Corner control for rough machining (CM-R)

- Path control with speed set as priority

- Energy control with accuracy set as a priority

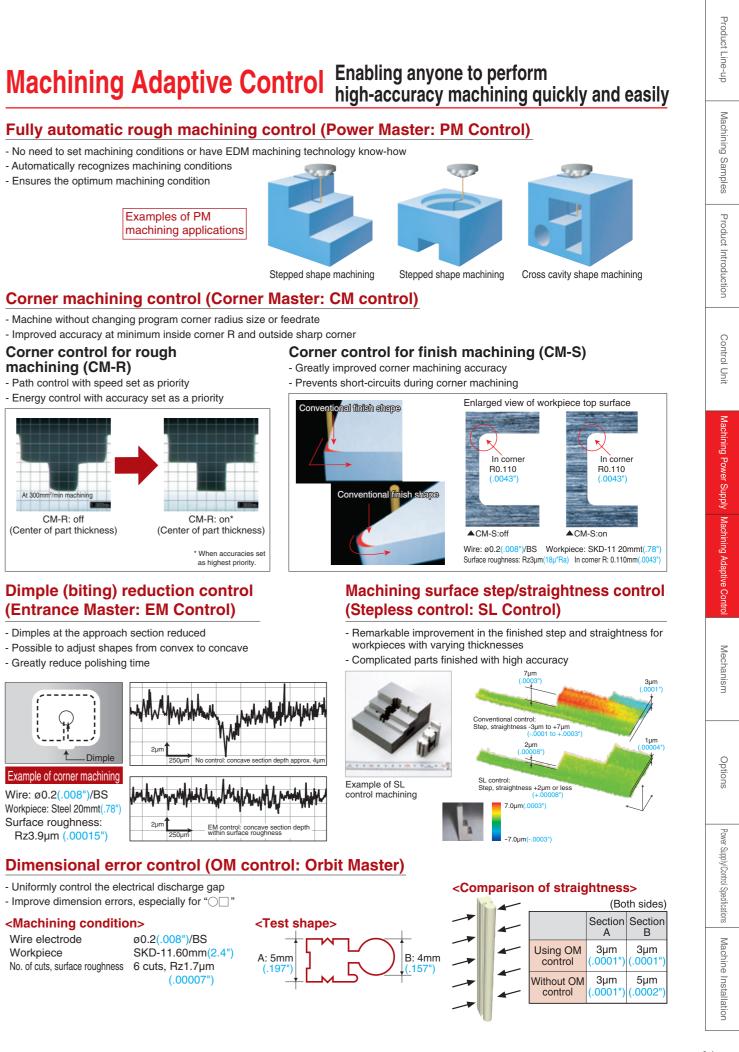


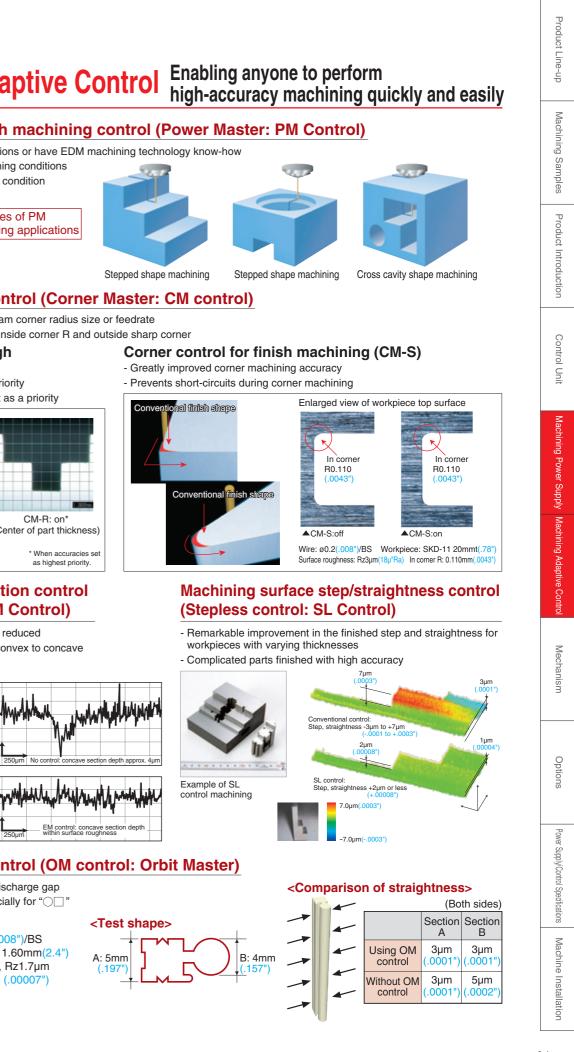
# Dimple (biting) reduction control (Entrance Master: EM Control)

- Dimples at the approach section reduced

- Possible to adjust shapes from convex to concave

- Greatly reduce polishing time





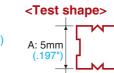
# Dimensional error control (OM control: Orbit Master)

- Uniformly control the electrical discharge gap

- Improve dimension errors, especially for "

<Machining condition>

Wire electrode Workpiece No. of cuts, surface roughness 6 cuts, Rz1.7µm



\*2 Compatible model: FA30V Advance

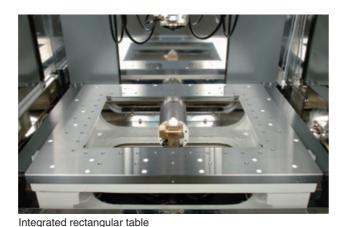
1.5

# Mechanism Continuing a never-ending challenge to ensure stable high-accuracy machining!

# Highly rigid machine structure

- Highly rigid drive system design based on the machine's center of gravity
- Special drive mechanism eliminates drag on the work tank seal plate
- Highly rigid one-piece table is used for easy part setup

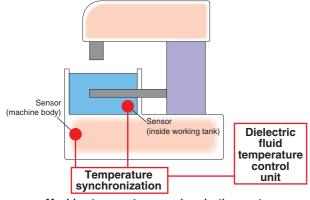


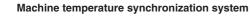


Machine center of gravity drive device

# Aiming for high accuracy with extensive temperature control

- Dielectric fluid temperature control system synchronized with machine structure temperature
- Working tank dielectric fluid circulation system suppresses temperature fluctuation during setup
- Lower arm cooling mechanism suppresses upper/lower relative displacement
- Inverter-controlled dielectric temperature controller realizes ±0.3°C(.5°F) temperature control





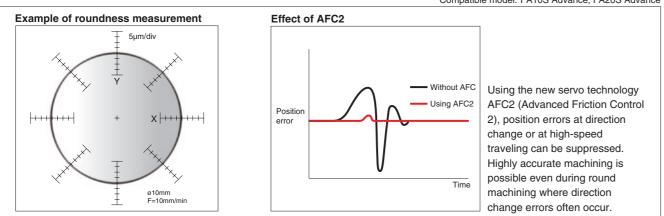
Advanced Friction Control System: AFC2\*

Working tank dielectric fluid circulation system

- Improve machine responsiveness with new servo technology

- Improve feed accuracy by suppressing disturbance during direction change and high-speed feed

\* Compatible model: FA10S Advance, FA20S Advance



# Standard linear scale

- All models equip with X/Y-axis linear scale
- Improve repeated positioning accuracy
- Ensure stable machining accuracy over long periods

# Mechanism pursuing long-term reliability

- Seal plate self-cleaning mechanism
- Stainless steel used for working tank and dielectric fluid reservoir
- Standard XY-axis linear scale



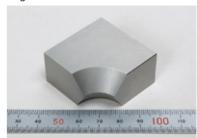
(Example for FA20S Advance)

# High-accuracy taper machining unit

- Angle Master Function realizes high-grade machining of large tapers
- Optimum taper specifications are automatically set to match the wire electrode angle

PROCEAN POS + 654	LARGE ANGLE TAPER
X 0.000	
Y 0.000	
U 0.000 #1	
V 0.000 #1	
Z 0.000 #1	LARGE ANGLE TAPER PARAMOT PARAMETER
	CALVA STANDARD ANGLE
ELATIVE POS -	Z AXIS HEIGHT 100.000
X 0.000	STANDARD ANGLE 5.000
Y 0.000	HEN ANGLE 1 MAX ANGLE 45
U 0.000	INTERVAL 3 ESTIMATE 1 Mours & Min.
V 0.000	473 0.000 MEAS HEACHT U \$5.000
Z 0.000	623 0.000 HEAS HEIGHT E 5.000
	MEASURE TIMES 1 D BORTON

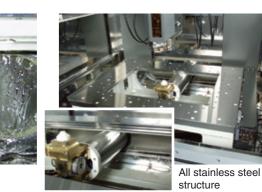
Angle Master



45° wide angle taper machining

17





Wire electrode Angle deviation point Specification value compensati Diamond die

Option

oduct Line

dn

MS S

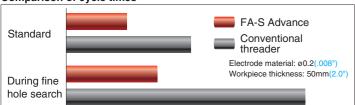
 $\leq$ 

# Improving productivity with our high-speed, highly-reliable AT system

# High-speed auto-threader: AT2

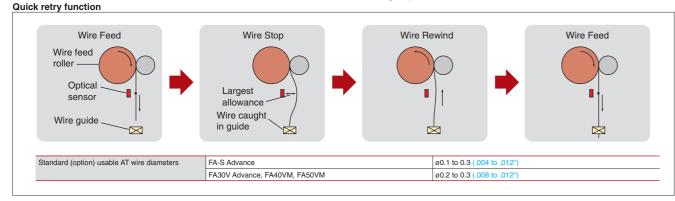
- High-speed, highly-reliable 10-second automatic threading
- Highly reliable broken wire collection method
- Simple structure for wire guide replacement parts

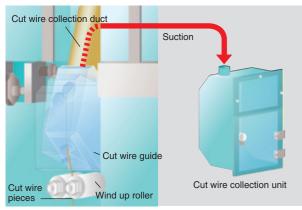
### Comparison of cycle times



High-sped auto-threader



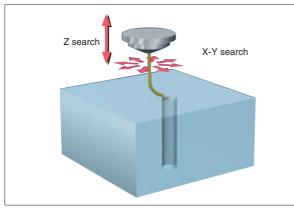




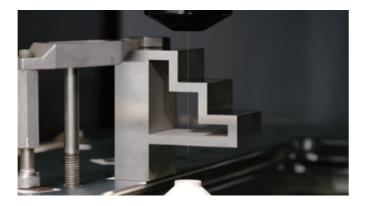
New cut wire collection mechanism

# Jet off wire insertion (AT Master)\*

- The automatic wire threading range has been increased for wire breakage point insertion, top/bottom countersunk hole insertion. slit insertion. small diameter initial hole and submerged threading.
- By using the AT Master guide kit and AT Enhance Mode setting, the auto-threading performance can be improved where using, jet stream on, causes enough turbulence to prohibit threading.
- \* Applicable models: FA10S Advance, FA20S Advance (option) Applicable wire diameter: ø0.2, 0.25BS. (.008, .010" BS)



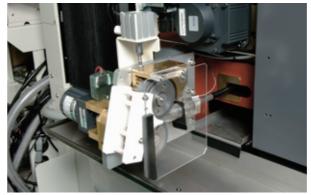
Fine-Hole search function



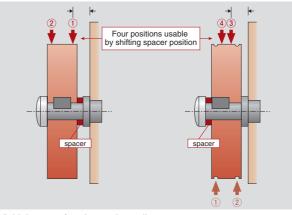
# Pursuing cost and maintenance efficiency

# **Pursuing cost efficiency**

- Running costs are reduced using a larger collection roller diameter and the main tension roller multiple times
- Power feeder terminal can be used 48 times (24 times on top. 24 times on bottom)
- The 4-piece filter extends service life (FA20S Advance: Option, FA30V Advance, FA40VM, FA50VM: Standard)



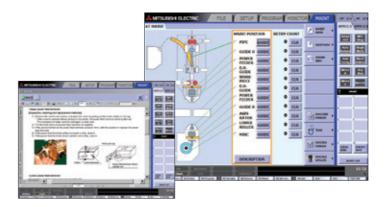
Larger collection roller + multiple usage



Multiple use of main tension roller

# Pursuing maintenance efficiency

- AT maintenance screen improves maintenance efficiency - Easy jet clean nozzle makes it easy to clean the work area - Auto-oiler system lubricates the X, Y-axis drive system





Simple wire-guide section



Easy jet clean nozzle

	Product Line-up
	Machining Samples
	Product Introduction
	Control Unit
	Machining Power Supply
	Machining Adaptive Control
	Mechanism
	Options
	Power Supply/Control Specifications
	Machine Installation
2	20

# **Options**

# **Abundant Options**



20kg (44lb) wire spool unit specifications



50kg (110lb) wire spooler unit specifications



Wire processing unit



AT Master guide kit The broken wire threading performance is enhanced with the dedicated top/bottom die kit (Type Z) and "AT Enhanced Mode" (Ø0.2, Ø0.25).



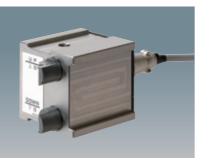
Angle Master guide kit







Advanced manual control box/ standard manual control box



Wire-alignment device



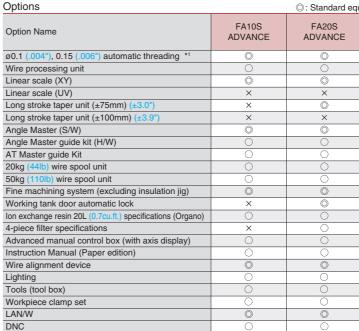
Lighting



Tools

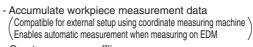


Workpiece clamp set



\*1 The ø0.1 (.004") and ø0.15 (.006") wires cannot be used with the wire processing unit. (These sizes can be used with continuous wire feeder after removing the wire processing unit.) \*2 Incompatible with continuous wire feeder method.

# Wire-Cut EDM Automation System

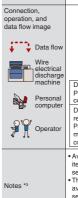


- Create processes offline - Automatically exchange workpiece using robot

FTP

<Personal computer> <Coordinate measuring machine> <Robot + WEDM: <Schedule software>





data. \*1

FA10S Advance

FA20S Advance FA30V Advance

FA40VM, FA50VM

Desire

Spec

equ	ipment (): Can be f	ield retrofitted •: Fa	actory installation or	nly X: Not available
	FA30V ADVANCE	FA30V ADVANCE (Z600 specifications)	FA40VM	FA50VM
	×	×	Х	×
	0	0	© *2	© *2
	0	O	O	O
	×	×	Х	×
	×	×	O	O
	O	O	Х	×
	0	0	0	0
	0	0	0	0
	×	×	×	×
	0	0	0	O
	0	0	0	0
	0	0	×	×
	0	0	0	O
	0	0	0	O
	0	O	0	O
	0	0	0	O
	0	0	0	O
	0	O	O	O
	0	0	0	0
	0	0	0	0
	0	0	0	Ó
	O	O	0	0
	0	0	0	0
	Ó	Ó	Ó	Ó

# LAN/W, DNC, FTP Options

Required options for network connections

A network connection enables the transmission/reception of various types of

As shown below, the required options for a network connection vary according to the desired network specifications.

i network speci	lications.		
Capability for connecting multiple nachines to multiple versonal computers. Capability for data ransmission/reception tt both the personal computer and machines ides.	Capability for connecting multiple machines to multiple personal computers.  Capability for data transmission/reception at personal computer side.	Capability for connecting multiple machines to multiple personal computers. Capability for data transmission/reception at machine side.	Capability for connecting multiple machines to a single personal computer. Capability for data transmission/reception at personal computer side. Capability for controlling the machines (starts, stops, etc.) from the personal computer. <sup>12</sup>
© Standard	-	This option can be added later. FTP (option) required.	This option can be added later. DNC (option) required.
_	This option can be added later. LAN/W (option) required.	This option can be added later. LAN/W (option) and FTP (option) required.	This option can be added later. LAN/W (option) and DNC (option) required.
Or			Data flow: Personal
Data flow: Personal Additional Machine computer Machine Data transmission/ reception: Possible at both the machine and personal computer sides.	Data flow: Personal → Machine computer Data transmission/ reception: Possible at the personal computer side only.	Data flow: Personal → Machine computer Data transmission/ reception: Possible at the machine side only.	Data transmission/ reception: Possible at the machine side only. Machine control: Possible from the personal computer only.
vailable as a standard term on the Advance teries. This specification is not vailable for the FA-V teries.	This specification is not available for the Advance series.	Commercially available FTP software must be installed in the personal computer.	Commercially available DNC software must be installed in the personal computer.  Available as a standard item on the Advance series (but not for machine control).

\*1 NC programs, machining conditions, and variables, etc., which can be input/output by the data I/O function \*2 For controllable operation details, refer to the DNC specifications. \*3 A machine IP address is required for a network connection.

Product Line-up

Machining Samples

Product

t Intro

Jction

g

Mech

nism

Insta

tion

# **Power Supply/Control Specifications**

### Power supply/control unit specifications

		specifications			E400V				
	Compatible model	FA10S ADVANCE	FA20S ADVANCE	FA30V ADVANCE	FA30V ADVANCE (Z600 specifications)	FA40VM	FA50VM		
		14/504		Power supply unit spec					
-	Model	WFSA	WFSA		WF	AV			
	Power supply circuit	Regenerative transistor pulse type							
	Cooling method		C	ompletely sealed/Indire	ect cooling				
	Maximum output current			50A					
ſ	Anti-electrolytic power supply		Anti-e	electrolytic power supp	ly in all modes				
	Power supply mode	7 types	7 types		8 ty	pes			
	Machine voltage selection	16 types	16 types		17 t	/pes			
Ī	Machining setting	18 types	18 types		211 1	vpes			
	OFF time		11.00	16 types		71			
2	Stabilization circuit A	8 types	8 types		10 t	Ines			
fiddno.	Stabilization circuit B	0 (3)000	0 ())000	16 types	101	1000			
5	Stabilization circuit C			3 types					
	Stabilization circuit E								
	Stabilization circuit E			5 types					
-		3 not			3 not				
		(Changeable with			(Changeable with				
	PM control	Workpiece material: Steel, t			Workpiece m				
		Applicable only for r			Applicable only for r				
		Not usable w	ith CS mode		Not usable w	rith CS mode			
ſ	AVR			Built-in					
ſ	Linit dim on dia na (march) (in)	550×600×1650	550×600×1650		650×63	0×1870			
	Unit dimensions (mm) (in)	(21.6×23.6×65.0)	(21.6×23.6×65.0)		(25.6×24	.8×73.6)			
h	Unit weight (kg) (lb)	240 (529)	240 (529)		350				
1		()		Control unit specific		· · · ·			
Т	Model	W31F	SA-2		FAV-2	W30	FAV-2		
ŀ	NC program input method	Won	Keyboard, USB flash mem		17.1-2		h memory, RS-232C		
ł	Pointing device		Touch panel, more				e pad		
ł			15" color TFT	use			olor TFT		
ŀ	Display		10.4 C						
ŀ	Display characters								
ł	Control method	CNC closed loop							
ŀ	Number of control axes			Max. 4 axes simultar					
	Setting unit			X, Y, U, V …1/0.1	μm				
	Minimum driving unit			50nm					
	Max. command value			±99999.999mr					
	Position command format		Comb	ined use of increment/	absolute value				
	Interpolation function			Linear, circular, and	spiral				
	O sala ma miliantian			0.00001 to 99.999999	(G code)				
	Scale magnification								
				0.001 to 9999.999(S	code)				
	Optimum feed control		Automatic selection o			ensina			
-	Optimum feed control Path-retrace control			of machining speed acc	ording to gap voltage s	ensing			
1110	Path-retrace control		Reve	f machining speed acc rse path retrace during	cording to gap voltage s a short-circuit	0			
	Path-retrace control Wire offset	5 types (	Rever ±99999.999mm Offs	of machining speed acc rse path retrace during set numbers: 1 to 900 (	cording to gap voltage s a short-circuit intersection point calcu	lation)	IDAS		
	Path-retrace control Wire offset Basic screen menu	5 types (	Reve	of machining speed acc rse path retrace during set numbers: 1 to 900 ( t, monitor, maintenance	a short-circuit intersection point calcu	lation)	/pes		
	Path-retrace control Wire offset Basic screen menu Automatic 2nd cut	5 types (	Rever ±99999.999mm Offs	of machining speed acc rse path retrace during et numbers: 1 to 900 ( t, monitor, maintenance Interactive screen m	a short-circuit intersection point calcu	lation)	ypes		
	Path-retrace control Wire offset Basic screen menu Automatic 2nd cut Machining condition (E-pack) storage	5 types (	Rever ±99999.999mm Offs	of machining speed acc rse path retrace during et numbers: 1 to 900 ( t, monitor, maintenance Interactive screen m 1 to 6999	cording to gap voltage s a short-circuit intersection point calcu e) nethod	lation)	ypes		
	Path-retrace control Wire offset Basic screen menu Automatic 2nd cut Machining condition (E-pack) storage Program number command	5 types (	Rever ±99999.999mm Offs	of machining speed acc rse path retrace during et numbers: 1 to 900 ( t, monitor, maintenanc Interactive screen m 1 to 6999 1 to 9999999	cording to gap voltage s a short-circuit intersection point calcu e) nethod	lation)	ypes		
	Path-retrace control Wire offset Basic screen menu Automatic 2nd cut Machining condition (E-pack) storage Program number command Sub-program	5 types (	Rever ±99999.999mm Offs	of machining speed acc rse path retrace during et numbers: 1 to 900 ( t, monitor, maintenanc Interactive screen m 1 to 6999 1 to 9999995 Nesting level 3	cording to gap voltage s a short-circuit intersection point calcu e) nethod	lation)	/pes		
	Path-retrace control Wire offset Basic screen menu Automatic 2nd cut Machining condition (E-pack) storage Program number command Sub-program Sequence numbers	5 types (	Rever ±99999.999mm Offs	f machining speed acc rse path retrace during let numbers: 1 to 900 (t t, monitor, maintenanco Interactive screen m 1 to 6999 1 to 9999999 Nesting level 3 1 to 99999	cording to gap voltage s a short-circuit intersection point calcu a) elethod 0	lation)	/pes		
	Path-retrace control Wire offset Basic screen menu Automatic 2nd cut Machining condition (E-pack) storage Program number command Sub-program		Rever ±99999.999mm Offs file, setup, machining support	f machining speed acc rse path retrace during et numbers: 1 to 900 ( t, monitor, maintenance Interactive screen m 1 to 6999 1 to 9999999 Nesting level 3 1 to 99999 Input on scree	cording to gap voltage s a short-circuit intersection point calcu e) eethod 0 0	lation) 4 ty	/pes		
	Path-retrace control Wire offset Basic screen menu Automatic 2nd cut Machining condition (E-pack) storage Program number command Sub-program Sequence numbers Manual input positioning		Rever ±99999.999mm Offs file, setup, machining support speed, medium-speed, low-s	f machining speed acc rse path retrace during tet numbers: 1 to 900 ( t, monitor, maintenance Interactive screen m 1 to 6999 1 to 99999999 Nesting level 3 1 to 99999 Input on scree peed, ultra-slow speed	cording to gap voltage s a short-circuit intersection point calcu e) ethod 0 0 1, inching (0.001mm/0.0	lation) 4 ty	/pes		
	Path-retrace control Wire offset Basic screen menu Automatic 2nd cut Machining condition (E-pack) storage Program number command Sub-program Sequence numbers	High	Rever ±99999.999mm Offs file, setup, machining support speed, medium-speed, low-s	f machining speed acc rse path retrace during let numbers: 1 to 900 ( t, monitor, maintenance Interactive screen m 1 to 6999 1 to 9999999 Nesting level 3 1 to 99999 Input on scree peed, ultra-slow speec Positioning function, A	cording to gap voltage s a short-circuit intersection point calcu a) nethod 0 0 1, inching (0.001mm/0.0 1 function	iation) 4 ty /005mm/0.0001mm)			
	Path-retrace control Wire offset Basic screen menu Automatic 2nd cut Machining condition (E-pack) storage Program number command Sub-program Sequence numbers Manual input positioning Manual operation box	High	Rever ±99999.999mm Offs file, setup, machining support speed, medium-speed, low-s	f machining speed acc rse path retrace during let numbers: 1 to 900 ( t, monitor, maintenance Interactive screen m 1 to 6999 1 to 9999999 Nesting level 3 1 to 99999 Input on scree peed, ultra-slow speec Positioning function, A	cording to gap voltage s a short-circuit intersection point calcu a) nethod 0 0 1, inching (0.001mm/0.0 1 function	iation) 4 ty /005mm/0.0001mm)			
	Path-retrace control Wire offset Basic screen menu Automatic 2nd cut Machining condition (E-pack) storage Program number command Sub-program Sequence numbers Manual input positioning	High XY plane	Rever ±99999.999mm Offs file, setup, machining support speed, medium-speed, low-s	f machining speed acc rse path retrace during iet numbers: 1 to 900 (t , monitor, maintenanco Interactive screen m 1 to 6999 1 to 999999 Nesting level 3 1 to 99999 Input on scree peed, ultra-slow speec Positioning function, A aling, 3D model displa	cording to gap voltage s a short-circuit intersection point calcu a) nethod 0 0 1, inching (0.001mm/0.0 1 function	lation) 4 ty 0005mm/0.0001mm) XY plane, XY-XZ plane, solid,	table scaling, 3D surface display		
	Path-retrace control Wire offset Basic screen menu Automatic 2nd cut Machining condition (E-pack) storage Program number command Sub-program Sequence numbers Manual input positioning Manual operation box	High XY plane	Rever ±99999.999mm Offs file, setup, machining support speed, medium-speed, low-s f , XY-XZ plane, solid, table sc	f machining speed acc rse path retrace during iet numbers: 1 to 900 (t , monitor, maintenanco Interactive screen m 1 to 6999 1 to 999999 Nesting level 3 1 to 99999 Input on scree peed, ultra-slow speec Positioning function, A aling, 3D model displa	cording to gap voltage s a short-circuit intersection point calcu a) nethod 0 0 1, inching (0.001mm/0.0 1 function	lation) 4 ty 0005mm/0.0001mm) XY plane, XY-XZ plane, solid, background drawing, auton	table scaling, 3D surface display.		
	Path-retrace control Wire offset Basic screen menu Automatic 2nd cut Machining condition (E-pack) storage Program number command Sub-program Sequence numbers Manual input positioning Manual operation box Graphics User memory capacity	High XY plane	Rever ±99999.999mm Offs file, setup, machining support speed, medium-speed, low-s f , XY-XZ plane, solid, table so round drawing, automatic ma 1GB	f machining speed acc rse path retrace during tet numbers: 1 to 900 ( t, monitor, maintenance Interactive screen m 1 to 999999 1 to 99999999 Nesting level 3 1 to 99999 Input on scree peed, ultra-slow speec Positioning function, A realing, 3D model displa tchining path drawing	cording to gap voltage s a short-circuit intersection point calcu e) ethod 0 0 1, inching (0.001mm/0.0 f function y,	lation) 4 ty 0005mm/0.0001mm) XY plane, XY-XZ plane, solid, background drawing, auton	table scaling, 3D surface display, natic machining path drawing		
	Path-retrace control Wire offset Basic screen menu Automatic 2nd cut Machining condition (E-pack) storage Program number command Sub-program Sequence numbers Manual input positioning Manual operation box Graphics User memory capacity Maintenance function	High XY plane	Rever ±99999.999mm Offs file, setup, machining support speed, medium-speed, low-s f , XY-XZ plane, solid, table sc round drawing, automatic ma 1GB Manager	f machining speed acc rse path retrace during tet numbers: 1 to 900 ( t, monitor, maintenance Interactive screen m 1 to 6999 1 to 99999999 Nesting level 3 1 to 999999 Input on scree peed, ultra-slow speed Positioning function, A ating, 3D model displa techning path drawing ment of consumable pa	cording to gap voltage s a short-circuit intersection point calcu e) ethod 0 0 1, inching (0.001mm/0.0 f function y,	lation) 4 ty 0005mm/0.0001mm) XY plane, XY-XZ plane, solid, background drawing, auton 100	table scaling, 3D surface display, natic machining path drawing DMB		
	Path-retrace control Wire offset Basic screen menu Automatic 2nd cut Machining condition (E-pack) storage Program number command Sub-program Sequence numbers Manual input positioning Manual operation box Graphics User memory capacity	High XY plane backç	Rever ±99999.999mm Offs file, setup, machining support speed, medium-speed, low-s f , XY-XZ plane, solid, table so round drawing, automatic ma 1GB	f machining speed acc rse path retrace during let numbers: 1 to 900 (t i, monitor, maintenance Interactive screen m 1 to 6999 1 to 999999 Nesting level 3 1 to 99999 Input on scree peed, ultra-slow speec Positioning function, A alling, 3D model displa tchining path drawing ment of consumable pa PM	cording to gap voltage s a short-circuit intersection point calcu a) b) c) c) c) c) c) c) c) c) c) c) c) c) c)	lation) 4 ty /005mm/0.0001mm) XY plane, XY-XZ plane, solid, background drawing, auton 10/ SL, CM	table scaling, 3D surface display, natic machining path drawing		

### Control Unit Functions

	10				
W31 (Adv	ance control unit) Control Unit	Functions		W30 Control Unit Functions	
Year, Month, Date display	Reference block	Program No. designation	Year, Month, Date display	Reference block	Program No. designation
Overlap window function	Single block		Overlap window function	Single block	
Character string replacement function	Dry run	Expanded A.W.F function	Character string replacement function	Dry run	RS232C interface
Geometric function	Automatic return	Graphics (drawing monitor)	Geometric function	Automatic return	Graphics (drawing monitor)
Floating decimal point function	User macro	Graphics (program check)	Floating decimal point function	User macro	Graphics (program check)
Control command	Automatic positioning (hole center, edge)	Graphics (automatic machining shape drawing)	Control command	Automatic positioning (hole center, edge)	Graphics (automatic machining shape drawing)
Corner R	Automatic zero point return	Graphics (surface display)	Corner R	Automatic zero point return	Graphics (surface display)
Corner chamfer	Machining start hole return	Offset	Corner chamfer	Machining start hole return	Offset
Linear angle command	Memory operation 1GB	Coordinate reading	Linear angle command	Memory operation 100MB	Coordinate reading
30-sec. short-circuit stop	Program edit	Time reading	30-sec. short-circuit stop	Program edit	Time reading
Simultaneous 2-axis wire alignment	Coordinate rotation	XY-axis independent scaling	Simultaneous 2-axis wire alignment	Coordinate rotation	XY-axis independent scaling
Workpiece inclination compensation	Pattern rotation	Axis rotation	Workpiece inclination compensation	Pattern rotation	Axis rotation
Automatic 2nd cut	Axis exchange	Maintenance check	Automatic 2nd cut	Axis exchange	Maintenance check
Simple automatic 2nd cut	Mirror image	Automatic taper degree calculation	Simple automatic 2nd cut	Mirror image	Automatic taper degree calculation
Block delete	Circumference calculation	Status recording	Block delete	Circumference calculation	Status recording
Pitch error compensation	Backlash compensation	Data variable operation	USB flash memory	Backlash compensation	Expanded A.W.F function
Repeated positioning	Soft limit (inside/outside prohibit)	Alarm display	MS-DOS data I/O	Pitch error compensation	Data variable operation
Automatic power failure recovery	Wire consumption estimate	Machining time estimate	Repeated positioning	Soft limit (inside/outside prohibit)	Alarm display
Workpiece coordinate system (106 items)	Hybrid Pack	Built-in 2D-CAD/CAM	Automatic power failure recovery	Wire consumption estimate	Machining time estimate
PM control	CM control	EM control	Workpiece coordinate system (106 items)	Hybrid Pack	Built-in 2D-CAD/CAM
SL control	OM control	Built-in 3D-CAM	PM control	CM control	EM control
Built-in 2D-CAD/CAM	3D graphic check	3D viewer (Parasolid data display)	SL control		
e-manual (Electronic instruction manual)	System update over web	3D model compatible PM control (3D-PM)			

# **Preparation for machine installation**

### . . .... ...

Check List for Installing Machine	
Determining the machining details	
Check each item, and make sure that no item or order is overlooked.	
1) Determine the workpiece	
2) Determine the machining site	
3) Determine the pre-processing site	
4) Determine the post-processing site	
Preparation of installation fixtures	
1) Plan the installation fixtures	
2) Prepare or manufacture the fixtures	
Preparation of consumable parts	
1) Purchase consumable parts such as the wire electrode	
Training of programmers and operators	
1) Select the programmers and operators	
2) Apply for training seminars	
3) Fill out and submit the DIAX-NET Membership and System Download User Membership.*1	
1. The System Download User Membership is available for customers of the Advance Series.	
Confirmation of foundation work and power supply	
f there is any possibility of radio disturbance, investigate it prior to starting wo	rk.
1) Confirmation of floor area	

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

### Confirmation of delivery path

Check the path inside and outside the factory to avoid any trouble during delivery.		
1) Traffic restrictions to factory		
Road width		
Entry road		
2) Factory entrance and width of gate in factory		
Factory building entrance dimensions (height x width)		
3) Constant-temperature, dust-proof room entrance dimensions (height × width)		

### Cautions

The standard delivery entrance dimensions for delivery in the standard shipping style are given on the The standard derivery entrance unimensions for derivery in the standard singling si product introduction page. If the entrance is smaller than the standard delivery en dimensions may be shipped with different dimensions. Contact a Mitsubishi Sales Office for details. (A separate estimate will be issued.) Note that delivery may not be pageille to entrance agent denoming on the dimensions.

very may not be possible in some cases depending on the dim

### Installation Conditions

### 1. Installation Place

1) Constant temperature dust-proof room

Recommended room temperature 20±1 [°C] (68°F ±2)

Usable temperature range 5 to 35 [°C] ( $44^{\circ}$  to 95°F) Fluctuation of the temperature will directly affect the machine accuracy, so to

maintain performance accuracy, select a place with little temperature fluctuation Install the EDM in a constant temperature room when performing high-accuracy machining even when using skim cuts.

- Note that an environment where the temperature fluctuates by 3°C (5°F) or more within 24 hours, or 1°C (2°F) or more within one hour can adversely affect the 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 Grinding dust can adversely affect the machine's linear ways and ball screws, so
- pay special attention to the installation location to avoid this hazard. (Separate from grinding machine, or install in separate room, etc.) • Humidity: Within 30 to 75%RH (with now 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 installation floor

Select an installation 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 20[Hz] frequency Consult with the contractor or vibration measuring instrument maker for details on the measuring method. ③ Foundation

The floor should be concrete with a thickness of 400mm (15.7") or more so it can sufficiently withstand the system's weight. \* Please consult about FA40VM and FA50VM separately.

2. Machine heating value

Approx. 8,140W of heat is generated per machine. (Of which 1,512W is heat generated by the dielectric fluid control unit.) (FA40VM: 8,965W, FA50VM: 9,515W) Take this into consideration when studying air-conditioning requirements.

3. Power supply equipment

Primary wiring 3-phase 200/220V±10% 50/60Hz±1Hz Power capacity FA-S Advance: 13.5kVA FA30V Advance: 15.0kVA FA40VM: 17.5kVA FA50VM: 19.2kVA Use a 14SQ or thicker cable for the primary connection.

### 4. Grounding work

The wire-cut EDM must always be grounded to prevent external noise, prevent radio disturbance, and prevent earth leakage

Class C grounding (grounding resistance 100 or less) as set forth in the Electric Facility Standards is recommended for the EDM.

· Class C grounding (isolated) is recommended. (Wire-cut EDM dedicated grounding.) (Fig. 1)

Note) Provide isolated grounding for each machine

· 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 14mm<sup>2</sup> grounding wire.

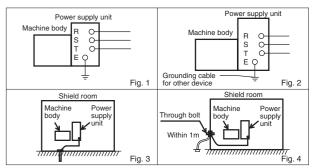
### 5. Primary air equipment

- Hose diameter: 1/4 hose (hose sleeve outer diameter: ø9.0)
- Pressure: 0.5 to 0.7MPa (70 to 100psi)
- Flow rate: 75L/min or more (2.6cu.ft./min.) \* FA30V Advance, FA30V Advance (Z600 spec.), FA40VM, FA50VM: 42L/min or more (1.5cu.ft./min.)

### 6. Shield room

Install a shield room if the wire-cut FDM affects televisions or other communication facilities in the area. Observe the following points when installing the wire-cut EDM in the shield room.

- 1. Ground the EDM in the shield room. (Fig. 3)
- 2. If the EDM cannot be grounded in the shield room, connect the wire-cut EDM's grounding cable to the shield room's grounding terminal (through bolt) as shown in Fig. 4.



# Precautions for Selecting Earth Leakage Breaker

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

# Disposal

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

# Harmonic Distortion

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

# Recommended wire electrode

Always use the following applicable wire electrodes.				
FBH	Furukawa Electric			
SBS-HN	Sumiden Fine Conductors			
HBZ-U(N)	Hitachi Cable			
OB-PN	Oki Electric Cable			

\* Use of non-recommended wires could result in problems. Always use the recommended wire

# **Recommended sliding surface lubricant**

Use the following lubricants on the sliding s	surface.
Maker	Product na

Maker	Product name
Exxon Mobil	Mobil DTE25
Idemitsu Kosan	Super Hydro 68A
Showa Shell	Terrace Oil
ENEOS	Super Mulpas DX68

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МЕМО	MEMO	Product Line-up
		Machining Samples
		Product Introduction
		Control Unit
		Machining Power Supply
		Machining Adaptive Control
		Mechanism
		Options
		Power Supply/Control Specifications
		Machine Installation

# Wire-cut EDM SYSTEMS



HEAD OFFICE: TOKYO BLDG., 2-7-3, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN NAGOYA WORKS: 1-14, YADA-MINAMI, 5-CHOME, HIGASHI-KU, NAGOYA 461-8670, JAPAN

\* Not all models are supported for all countries and regions.
 \* The specifications of machine differ according to the country and region, so please check with your dealer.

\* Processing data provided in this brochure is for reference only.