Wire-cut EDM Systems
MV Series
New generation makes it's mark in a continuously updated lineage.
MITSUBISHI ELECTRIC Wire-cut EDM Systems

MV Series
Next-generation Innovations of our best selling Performance Machine
Wire-cut EDM Systems Line up

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

**MV-R Series**
High-performance model innovating next-generation high-performance machine

**MV-S Series**
Standard model pursuing a cost performance standard machine

**PA05S ADVANCE**
Flagship model incorporating extreme precision machining

**MP Series**
High-class model incorporating a ultra-high accuracy machining

**Ultrahigh accuracy machines**

**MX600**
Flagship model incorporating extreme precision machining

**PA05S ADVANCE**
Flagship model incorporating extreme precision machining

**Micro slit width 23μm**

**High-performance machine**

**MV-R Series**
High-performance model innovating next-generation high-performance machine

**High-productivity machine**

**MV-S Series**
Standard model pursuing a cost performance standard machine
Revolutionary MV1200R / MV2400R
High-performance Wire-cut EDMs

MV1200R
(manual vertical front door)

MV2400R
(automatic vertical front door)

Standard MV1200S / MV2400S
Standard Wire-cut EDMs

MV1200S
(manual vertical front door)

MV2400S
(automatic vertical front door)
MV1200R/S

<Outline drawing>

One-piece 4-sided table hardened stainless steel (MV1200R)

<Table drawing>

Trave (12.6)

10-M8 tapped holes

39-M8 tapped holes

MV2400R/S

<Outline drawing>

One-piece 4-sided table hardened stainless steel (MV2400R)

<Table drawing>

Three-piece U-shaped table hardened stainless steel (MV2400S)

Machine Installation

- Long Life System
- Revolution
- Options
- Natural User Interface
- Intelgent AT
- Opt Drive System
- Precision Flush Circuit
- Machine Installation

Product Line-up

- Functions and Features
- Samples
- Machine Size

Standard specifications

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>MV1200R</td>
<td>1050×410×320 (4-sided)</td>
<td>600×195 (7.1)</td>
<td>640×255×540 (4-sided)</td>
<td>400×157×300 (11.8×220×8.7)</td>
<td>400×157×300 (11.8×220×8.7)</td>
<td>15 (max. 260°)</td>
<td>0.1 (0.04)–0.3 (0.12)</td>
<td>0.05</td>
<td>10 (20)</td>
<td>6 (4)</td>
<td>Paper Filter (2)</td>
<td>5 (3)</td>
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<td>6 (4)</td>
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<td>6 (4)</td>
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<td>5 (3)</td>
<td>10 (20)</td>
<td>6 (4)</td>
</tr>
<tr>
<td>MV2400R</td>
<td>1325×560×305 (4-sided)</td>
<td>750×215 (7.6)</td>
<td>840×255×450 (4-sided)</td>
<td>460×157×300 (11.8×220×8.7)</td>
<td>520×157×300 (11.8×220×8.7)</td>
<td>15 (max. 260°)</td>
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<td>1325×560×305 (4-sided)</td>
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<td>10 (20)</td>
<td>6 (4)</td>
<td>Paper Filter (2)</td>
<td>5 (3)</td>
<td>10 (20)</td>
<td>6 (4)</td>
</tr>
</tbody>
</table>

Options for MV-R series

- Automatic wire threading
- Digital AE [power supply]
- LAS/W
- Angle Master (5xW)
- Anti-virus protection (MV1200R/2400R)
- Sleep mode (MV1200R/2400R)
- Angle Master ADVANCE [8/W]
- Digital-FS power supply
- High voltage power supply (for processing-resistant materials)
- COREHOLD

Options

- 20kg(44.1lb)/25kg(55.1lb) wire spool unit
- Angle Master guide kit ø0.15(0.006")
- Advanced manual control box
- External signal output
- 3-color warning light
- Run timer
- Option box
- LED light
- 4-piece filter system (MV2400R/2400S)
- Anti-virus protection (MV1200S/2400S)

MV2400R

<Layout drawing>

(Unit:mm)

230×940 (3.7) 840(33)×560(22) (U-shaped)

MV1200S

<Layout drawing>

(Unit:mm)

230×940 (3.7) 840(33)×560(22) (U-shaped)

A: Clean tank drain port Fitted with PT1 screw valve (165mm from floor)
B: Dirty tank drain port Fitted with PT1 screw valve (165mm from floor)
C: Power supply port 200/220VAC±10% 50/60Hz, 13.5kVA
D: Primary air side 0.5 to 0.7MPa, 75 l/min or more, 1/4 hose connection (hose sleeve outer diameter: ø9mm)

*1 is min.500(19.7) and *2 is min.700(27.6) when the 20kg(44.1lb) wire spool unit is mounted.

Machine unit dimensions

Weight:1910mm(75.2) Height:2015mm(79.3)

Machine Installation Long Life System Revolution Options Natural User Interface Intelligent AT Opt Drive System Precision Flush Circuit Machine Installation

General input [kVA]

13.5

Required air rate

- 0.5(2) – 0.7(101)
- 792.8 or more

Sample Machine Specifications

- 2700/3902 (including dielectric fluid reservoir)
- 550/145
- 3500/716
- 860/227
- 390(72)

*1 ø0.2(0.008") DD guides and ø1.3(0.006") jet nozzle are standard equipment.
**Product Line-up**

**MV2400S** (column up specification)
- 2-axis LSM (XY linear shaft motor)
- Four-sided hardened table
- Automatic vertical front door

**MV4800**
- 2-axis LSM (XY linear shaft motor)
- U-shaped hardened table
- Automatic vertical front door
MV4800

<Table drawing>

One-piece 4-sided table hardened stainless steel

MV2400S (column up specification)

<Table drawing>

Three-piece U-shaped table hardened stainless steel

Standard machine specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>MV2400S (column up specification)</th>
<th>MV4800</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. workpiece dimensions [mm][in]</td>
<td>1050(41.3)×820(32.3)×420(16.5)</td>
<td>1250(49.2)×1020(40.2)×505(19.9)</td>
</tr>
<tr>
<td>Max. workpiece weight [kg][lb]</td>
<td>1500(3307)</td>
<td>3000(6614)</td>
</tr>
<tr>
<td>Table dimensions [mm][in]</td>
<td>840(33.1)×640(25.2) (4-sided)</td>
<td>1080(42.5)×780(30.7) (U-shaped)</td>
</tr>
<tr>
<td>Machine travels [X-Y-Z] [mm][in]</td>
<td>600(23.6)×400(15.7)×425(16.7) (XY axis OPT-drive specifications)</td>
<td>800(31.5)×600(23.6)×510(20.1) (XY axis OPT-drive specifications)</td>
</tr>
<tr>
<td>Max. taper angle</td>
<td>0.1(.004) ~ 0.3(.012)*1</td>
<td>0.15(.006) ~ 0.3(.012)*1</td>
</tr>
<tr>
<td>Wire diameter [mm][in]</td>
<td>755(30.0)</td>
<td>1000(39.4)</td>
</tr>
<tr>
<td>Weight [kg][lb]</td>
<td>3850(8407)</td>
<td>5700(12566)</td>
</tr>
<tr>
<td>Tank capacity [l][gal]</td>
<td>390(25)</td>
<td>1480(391)</td>
</tr>
<tr>
<td>Filtration method</td>
<td>Paper filter (2)</td>
<td>Paper filter (4)</td>
</tr>
<tr>
<td>Filtered particle size [μm]</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Oil filter (oil exchange unit)</td>
<td>100(3.9)</td>
<td>100(3.9)</td>
</tr>
<tr>
<td>Dielectric fluid chiller unit</td>
<td>Unit cooler</td>
<td>Unit cooler</td>
</tr>
<tr>
<td>Weight (dry) [kg][lb]</td>
<td>390(860)</td>
<td>450(992)</td>
</tr>
</tbody>
</table>

*1 ø0.2(0.008) DD guides and ø1.5(0.006) jet nozzle are standard equipment.

MV4800

<Table drawing>

<Layout drawing>

Footprint: 3637(143.0)×4222(166.2) (including maintenance space)

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Width</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>MV2400S</td>
<td>680(26.8)×760(29.9)×420(16.7)</td>
<td>800(31.5)×600(23.6)×510(20.1)</td>
</tr>
<tr>
<td>MV4800</td>
<td>750(29.5)×450(17.7)×250(9.8)</td>
<td>1050(41.3)×820(32.3)×420(16.5)</td>
</tr>
</tbody>
</table>

Options

- Advanced manual control box
- Option box
- LED light
- 4-piece filter system
- Anti-virus protection

General input

<table>
<thead>
<tr>
<th>[kVA]</th>
<th>13.5</th>
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<tbody>
<tr>
<td>Required air rate</td>
<td>(50Hz)</td>
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<tr>
<td>Air rate</td>
<td>[cu.ft./min]</td>
</tr>
</tbody>
</table>

Standard functions

- Automatic wire threading
- Digital AE [power supply]
- LAN/W
- Angle Master (SW)
- Sleep mode (MV4800)
- 4-piece filter system (MV4800 specification)
Functions and Features

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

High-value-added machining <options for MV-R series>

- **Digital-FS power supply**
  - Optimum surface roughness of Rz0.4μm/Ra0.05μm (Tungsten carbide)
  - Wire electrode: ø0.2(.008")/BS
  - Workpiece: Tungsten carbide, t10mm (.4")
  - Surface roughness: Rz0.4μm/Ra0.05μm

- **ø0.05(.002"), ø0.07(.003") automatic wire threading**
  - ø0.05(.002") wire electrode available
  - Wire electrode: ø0.05(.002")/SP
  - Workpiece: Steel(PD613), Length 20mm (.79") width 2mm (.08")

**Innovative automatic wire threading**
- New annealing system greatly improves wire threading with a curl ratio of less than 10%
- Wire break point insertion is greatly improved for thick workpieces
- Wire threading mode can be selected to match the workpiece shape (i.e., jet stream on, jet stream off and submerged break point insertion)

**Improved machining accuracy**
- Equipped with a linear shaft motor (LSM)
- Mitsubishi Electric’s optical drive system uses fiber-optic communications between the control unit, servo amplifier and linear motor to improve machining accuracy

Ultimate optimization of EDM technology

**Super Digital Control**

- **dmXs® Digital Matrix Sensor**
- Digital technology optimizes all enhanced functions required by Wire-cut EDMs

**ADVANCE control unit**
- Digital-FS power supply
- Yokogawa feedback
- Servo amplifier
- LSM with linear glass scale feedback
**MV1200S / MV2400S**

**Energy savings, low running cost**

- Power consumption reduced up to 69%
  - **Conventional model**
    - MV-S: Reduced 55%
    - MV-R: Reduced 69%
- Filter cost reduced up to 45%
  - (Automatic changing filtration flow rate)
- Wire consumption reduced up to 46%
  - **Conventional model**
    - MV-S: Reduced 42%
    - MV-R: Reduced 46%
- Ion exchange resin cost reduced up to 25%
  - **Conventional model**
    - MV-R/S: Reduced 45%

**Improved productivity**

- Faster machining is realized with improved power-supply performance
  - (Rz2.5μm/Ra0.45μm with 3 cuts)
  - (Rz2.0μm/Ra0.28μm with 4 cuts)
- All machining conditions are provided
  - (speed condition, nozzle release condition)
- Machining time comparison for Rz3.5μm/Ra0.45μm with 3 cuts

**Easy operation**

- Search function for machining conditions is improved by a narrow-down function
- Job scheduling adjustments use the schedule call back, extra job insertion and ME-pack feature
- ME-pack is a package of machining processes including offset, machining speed and adaptive control settings

**COREHOLD (Sludge retention)**

The sludge to be automatically held in place after the rough cut for complete unattended operation

- Wire electrode: ø0.2(0.008")/BS
- Workpiece: Steel(SKD11), t5mm(0.2")

**Angle Mater ADVANCE**

Taper accuracy is improved regardless of wire angle direction

- Wire electrode: ø0.2(0.008")/BS
- Workpiece: Steel(SKD11), t140mm(5.5")

**ADVANCE PLUS control offers maximum efficiency using a fully optical drive system (MV1200R/2400R)**

- Machining time reduced up to 17% (FA series ratio)
- Corner accuracy ±1μm
- Circular accuracy within 2μm
- Power consumption reduced up to 69% (FA Series ratio)
- Anti-virus protection
  - McAfee® is a registered trademark of McAfee, Inc. in the United State and other countries

**ADVANCE PLUS control offers maximum efficiency using a fully optical drive system (MV1200R/2400R)**

**Product Line-up**

**Functions and Features**

- Machining Samples
- Natural User Interface
- Power Supply, Control Specifications
- Machine Installation Long Life System Revolution Options Intelligent AT Opt Drive System

**Advantages**

- Reduced 17%

**Improved productivity**

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

**Easy operation**

- Compared to conventional Mitsubishi Electric Wire-cut EDM (FA Series)
Highly accurate pitch machining

Model: MV2400R
Electrode material: ø0.2(.008")/BS
Workpiece: Steel(PD613)
Workpiece thickness: 20mm(.787")
Surface roughness: Rz2.5μm/Ra0.32μm/13μ"Ra
Machining accuracy: Pitch ±2μm

- Stable automatic threading is realized using Intelligent AT during multi-shape machining
- Highly accurate machining is possible using ODS

Connector machining

Model: MV1200R
Electrode material: ø0.2(.008")/BS
Workpiece: Steel(SKD11)
Workpiece thickness: 4~25mm(0.16~0.98")
Surface roughness: Rz3.1μm/Ra0.38μm/15μ"Ra
Machining accuracy: ±3μm

- Highly accurate machining is possible using ODS
- A machining accuracy of ±3μm is realized for high L/D machining of pin widths from 1.0 to 4.5mm and a length of 40mm

Gear machining

Model: MV1200R
Electrode material: ø0.1(.004")/BS
Workpiece: Steel(SKD11)
Workpiece thickness: 5mm(.197")
Surface roughness: Rz2.0μm/Ra0.26μm/10μ"Ra
Machining accuracy: ±2μm

- Highly accurate machining is possible using ODS
- New corner machining control (CM3) improves shape accuracy to within ±2μm under nozzle release conditions

Circular machining

Model: MV1200R
Electrode material: ø0.2(.008")/BS
Workpiece: Steel(SKD11)
Workpiece thickness: 30mm(1.181")
Surface roughness: Rz2.0μm/Ra0.28μm/11μ"Ra
Machining accuracy: Roundness 2.0μm

- Circular accuracy is improved using ODS
- Bumps or undercuts at the approach point are suppressed, attaining precise circular cuts

Cutting edge machining

Model: MV1200R
Electrode material: ø0.2(.008")/BS
Workpiece: Steel(SKD11)
Workpiece thickness: 20mm(.787")
Surface roughness: Rz2.5μm/Ra0.32μm/13μ"Ra
Machining accuracy: ±3μm

- Highly accurate machining is possible using ODS
- Improved taper accuracy using PFC creates uniform cutting edge lengths

Thick workpiece machining

Model: MV2400S
Electrode material: ø0.25(.010")/BS
Workpiece: Steel(SKD11)
Workpiece thickness: 200mm(7.9")
Surface roughness: Rz4.8μm/Ra0.71μm/28μ"Ra
Machining accuracy: ±3μm

- High-speed and precise straight machining are possible using PFC
- A straight-line accuracy within 5μm is possible even with a 200mm-thick workpiece

* 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)
**Punch**

- **Model:** MV2400R
- **Electrode material:** ø0.2 (.008") / BS
- **Workpiece:** Steel (SKD11)
- **Workpiece thickness:** 60mm (2.36")
- **Surface roughness:** Rz1.2μm/Ra0.18μm/Ra
- **Machining accuracy:** ±2μm
- **Features:** Ultrafine surface finish is possible using Digital-FS for punch machining.
- **Note:** ±5μm

**Taper**

- **Model:** MV2400R
- **Electrode material:** ø0.2 (.008") / Mega-T
- **Workpiece:** Steel (SKD11)
- **Workpiece thickness:** 30mm (1.18")
- **Surface roughness:** Rz4μm/Ra0.6μm/Ra
- **Machining accuracy:** Taper ±0.01°
- **Features:** Taper accuracy is improved regardless of wire angle direction using Angle Master ADVANCE II.
- **Note:** Angle Master ADVANCE II <option for MV-R series>

**Pitch machining**

- **Model:** MV2400R
- **Electrode material:** ø0.2 (.008") / BS
- **Workpiece:** Steel (SKD11)
- **Workpiece thickness:** 50mm (1.97")
- **Surface roughness:** Rz18μm/Ra2.7μm/Ra
- **Machining accuracy:** ±5μm
- **Features:** COREHOLD provides sludge retention to hold core after the rough cut for complete unattended operation. (Sludge retention positions and lengths can be automatically set in place.)
- **Note:** COREHOLD <option for MV-R series>

**Slide core**

- **Model:** MV2400S
- **Electrode material:** ø0.2 (.008") / BS
- **Workpiece:** Steel (SKD11)
- **Workpiece thickness:** Die: 100mm (3.9")
- **Surface roughness:** Rz3.5μm/Ra0.45μm/Ra
- **Machining accuracy:** ±5μm
- **Features:** Thick workpieces can be machined with high straight-line accuracy using ODS.
- **Note:** ±3μm

**Fit machining**

- **Model:** MV1200S
- **Electrode material:** ø0.2 (.008") / BS
- **Workpiece:** Steel (SKD11)
- **Workpiece thickness:** Die: 20mm (0.78")
- **Surface roughness:** Rz2.0μm/Ra0.28μm/Ra
- **Machining accuracy:** ±3μm
- **Features:** Stable automatic threading is realized using Intelligent AT during multi-shape machining.
- **Note:** ±3μm

**Parts machining**

- **Model:** MV1200S
- **Electrode material:** ø0.2 (.008") / BS
- **Workpiece:** Titanium alloy
- **Workpiece thickness:** 40mm (1.6")
- **Surface roughness:** Rz2.2μm/Ra0.28μm/Ra
- **Machining accuracy:** ±5μm
- **Features:** High-speed and highly accurate machining are possible using PFC.
- **Note:** ±5μm

* 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)
Innovative Automatic Wire Threading

Advanced technology for greatly improved productivity

**Improved automatic wire threading**

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

- Multiple level wire threading is possible by setting the AT jet mode to off. Highly dependable automatic threading for multi-opening applications
- Stable automatic threading is realized during pitch machining
- Wire break point insertion is possible
**Wire electrode annealing structure**

- Improved wire annealing power supply and tension control enhance wire threading (producing a curl ratio of 10% or less), which straightens the natural curl caused by spooling.
- The greatly lengthened distance of annealed wire improves automatic wire threading for thick workpieces.

*A curl ratio of less than 3% applied for the conventional model (FA Series)*

**New jet water flow mechanism**

- Flow analysis simulation has been used to optimize the water flow mechanism for straightening the jet stream, which improves wire threading for thick workpieces.

**Wire collection unit**

- Broken wire collection, which clears the upper guide after a wire break, has been improved so it handles even highly curled wire without hesitation.

**Wire feed wiper**

- A felt wiper added to the wire path removes manufacturing impurities from the wire surface, which reduces slippage on the drive rollers.

**One-touch lever clamp mechanism**

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

**Diamond guide**

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

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

**Linear Shaft Motor**

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

---

Utilizes all magnetic flux as an effective driving force.
**Shape control power supply (Digital-AE II)**

- Wire straightness is digitally controlled with the world's only electrical-discharge position control (As of Mar. '12)
- Total machining time is reduced by improving straightness accuracy during rough, intermediate and finishing processes

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

- No need to set machining conditions or have knowledge of EDM machining
- Automatically recognizes machining conditions and makes adjustments for the optimum machining condition
- Analyzes 3D data and recognizes shape characteristics
- Eliminates transition lines which appear easily in stepped machining areas
- Improves machining speed with nozzle closing conditions

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

- Reduces dimples at the approach section
- Allows shape adjustment from convex to concave
- Greatly reduces polishing time

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

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

**Dimensional error control (OM control: Orbit Master)**

- OM control is designed to attain a uniform electrical-discharge gap regardless of the corner shape
- Improves the radial shape error and greatly improves the total part accuracy

**Wire tension control (TS Master)**

- Suppresses tension fluctuation for more stable machining
- Suppresses lines on the machined surface after polishing

---

**Comparison of straightness accuracy during finish machining**

- Workpiece: Steel
- No. of cuts: 5
- Electrode material: ø0.25mm (.010”)

**Examples of PM machining applications**

- Stepped shape machining
- Cross-cavity shape machining

**Comparison of straightness**

- Using OM control
- Without OM control

**Wire tension control**

- Suppresses tension fluctuation for more stable machining
- Suppresses lines on the machined surface after polishing

---

**Conventional corner control**

- In-corner 60° (R0.2mm) (.008”)
  - Shape error: 2 to 3μm
- In-corner 90° (R0.15mm) (.006”)
  - Shape error: 1μm

**Corner machining control using CM3**

- Corner machining control
- Realizes highly accurate shape machining even for complicated geometries with several types and sizes of corners
- Corner accuracy is easily controlled by the operator

**Comparison of corner accuracies**

<table>
<thead>
<tr>
<th>Corner Type</th>
<th>Conventional corner control</th>
<th>CM3</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-corner 60° (R0.2mm) (.008”)</td>
<td>Shape error: 2 to 3μm</td>
<td>Shape error: 1μm</td>
</tr>
<tr>
<td>In-corner 90° (R0.15mm) (.006”)</td>
<td>Shape error: 1μm</td>
<td>Shape error: 1μm</td>
</tr>
</tbody>
</table>
Improved Productivity

Wide range of technologies for ever-changing working environments

High-speed machining has been enhanced by newly improved power-supply performance for multi-pass type jobs

Machining time comparison for Rz3.5μm/Ra0.45μm with 3 cuts

<table>
<thead>
<tr>
<th></th>
<th>Conventional model</th>
<th>MV-S</th>
<th>MV-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>100(%)</td>
<td>Reduced 9%</td>
<td>Reduced 17%</td>
</tr>
</tbody>
</table>

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

Machining time comparison for Rz2.0μm/Ra0.28μm with 4 cuts

<table>
<thead>
<tr>
<th></th>
<th>Conventional model</th>
<th>MV-S</th>
<th>MV-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>100(%)</td>
<td>Reduced 9%</td>
<td>Reduced 17%</td>
</tr>
</tbody>
</table>

*Compared to conventional Mitsubishi Electric Wire-cut EDM (FA Series)
**Table insulation <MV1200R/S, MV2400R/S>**

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

**Wire guide**

- Flow analysis simulation has been used to optimize the water flow through the guide, enhancing cutting speed by improving sludge removal from the gap

**High-speed digital control**

- Spark detection speed (up to twice as fast as our conventional model) provides improved discharge efficiency and suppresses wire breakage simultaneously while improving machining speed

**High-accuracy taper machining using round dies**

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

  - Angle Master guide kit is optional
  - Max. taper angle is 45° (at max. 40 [1.6"] mm)

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

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

---

*Photo shows a comparison under adverse conditions where electrolysis occurs easily*
Easy Operation
User-friendly features ensure easy operation

Ergonomic design
- User-friendly keyboard and mouse
- Easy-to-view screen (15-inch)
- Intuitive operations using touch-panel control

Set-up screen
- Outstanding graphics supporting easy operation

Work piece pick-up positioning
- Highly accurate workpiece pick-up positioning is possible with the water flow on or when a workpiece is submerged

Machining condition search function
- Interactive operation easily creates NC data with machining condition
- Job scheduling adjustment uses the schedule call back, extra job insertion and ME-pack feature
  *ME-pack is a package of machining processes including offset, machining speed and adaptive control setting

Work alignment function
- By measuring the workpiece flatness with a dial indicator, the wire tilt can be automatically compensated to match the angle of the part, further reducing set-up time

Advanced 3D data for machine control
- Reads and displays 3D CAD data (Parasolid format *) with a built-in 3D CAM
- Extracts 3D model contours with a built-in 3D CAM
- Creates NC data including machining conditions (ME-pack), through the built-in CAM system
- 3D-PM improves machining performance by (3D model shape analysis and optimum machining control)
  * Parason is a registered trademark of UGS PLM Solutions Co., Ltd.

*1 Parasolid is a registered trademark of UGS PLM Solutions Co., Ltd.
**Hardened table and all stainless steel structure**
- Equipped with a hardened table
- The working tank and dielectric supply unit are made of stainless steel
- Resistant to deterioration by dielectric fluid and sludge

**Cleaning mechanism <MV2400R/S>**
- A forced-flush self-cleaning mechanism prevents sludge from sticking to the stainless-steel seal plate

**Wire travel system**
- The stability of the wire tensioning system is improved by a felt wiper and felt keeper pads that eliminate the chance of the wire jumping off the rollers

**Dielectric fluid supply unit**
- A large access window into the fluid tank provides easy entry for cleaning

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

**Precise positioning**
- Highly accurate workpiece pick-up positioning is possible with the water flow on or when a workpiece is submerged

**Dielectric fluid flow meter and jet flow adjustment valve**
- Dielectric flow meters are easy to read
- The adjustable jet flow valve increases the range of work that can be done

**Filter pressure gauge and jet cleaning nozzle**
- Easily read the filter pressure
- The convenient location of the jet cleaning nozzle makes tank clean-up easy

**Unit cooler filter**
- Chiller air filter

**Broken wire collection box**
- Conveniently located at the front for easy maintenance
Energy savings, low running cost

Realizing low costs and environment-friendly operation

**Power consumption reduced up to 69%**

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

- Power consumption reduced by ODS

**Filter cost reduced up to 45%**

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

**Wire consumption reduced up to 46%**

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

**Ion exchange resin cost reduced up to 25%**

Enhanced power-supply conditions can be used with a lower fluid resistivity setting by PFC

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

- Total running cost reduced up to 42%, which is accounted for 90% by filter, ion exchange resin and power consumption.

Wire electrode: ø0.2(0.008")/BS  
Workpiece: Steel(SKD11), t60mm(2.4")  
Surface roughness: Rz3.5μm/Ra0.45μm

New energy-saving mode (Sleep Mode) -MV1200R/2400R-

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

EDM work  
[Fluid system shut-down time]  
Saves electricity by supplying only the minimum required amount of power  
Supplies power and supplies dielectric fluid to the bottom of the table  
Supplies dielectric fluid to the bottom of the table

Temperature adjusted so machine can be used immediately

Start of work  
6:00  
Wake-up  
[Fluid system start-up time]  
End of work  
22:00  
[Fluid system shut-down time]

Flat power feed terminal

- The flat shape makes it easy to index to the next location.
- A total of 48 index locations can be used (24 on each side).

Main tension roller

- Multiple indexing locations greatly reduce running costs.

Large-diameter collection roller

- Large collection roller with multiple index locations greatly reduces running cost.
Revolution (MV1200R/2400R)

Realizing high-value-added machining with a top ranking technology

ADVANCE PLUS control is standard on the MV1200R/2400R

High-value-added functions are available on the MV1200R/2400R (option)

φ0.05 (.002"), φ0.07 (.003") automatic wire threading

- φ0.05 (.002") wire electrode available
- Minimum in-corner R 30µm (0.0012")
- Improved design reduces maintenance

Digital-FS power supply

- Optimum surface roughness of Rz0.4µm/Ra0.05µm (tungsten carbide)
- Optimum surface roughness of Rz1.0µm/Ra0.12µm (steel)
- Machining with the workpiece set directly on the table (insulation jig not required)
- Machining range not limited (entire XY stroke area)

Angle Master ADVANCE II

- ODS provides high accuracy even when cutting a UV independent tapered shape
- Taper accuracy is improved regardless of wire angle direction (Taper accuracy error reduce 1/5)
  *Compared to conventional Mitsubishi Electric Wire-cut EDM (FA Series)

COREHOLD (Slug retention)

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

High voltage power supply (for processing-resistant materials)

- Machining speed improved for processing-resistant materials (sintered diamonds/boron nitride)
**Improved machining speed**
- New V350 V power-supply control realizes high-speed machining
- Optimized control of power-supply during intermediate finishing processes reduces total machining time

**Improved corner accuracy**
- ODS provides high accuracy even when cutting a U-V independent tapered shape
- Machining accuracy is improved in very small inside & outside corner radii

**Improved circular accuracy**
- Compensation accuracy improved by new AFC III servo control

**Energy savings**
- Energy consumption is reduced according to the current job ending time and the next day's starting time (Sleep Mode)

**Security**
- Anti-virus protection is provided as standard by one of the world leaders in security control
- Pattern file can be used semi-permanently without renewal

**Machining time reduced up to 17%**
- Conventional model
  - MV-S
  - MV-R
- Wire electrode: ø0.21 (.008")/BS
- Workpiece: Steel(SKD11), t60mm (2.4")
- Machining time comparison for Rz3.5μm/Ra0.45μm with 3 cuts
  - *Compared to conventional Mitsubishi Electric Wire-cut EDM (FA Series)*

**Corner accuracy ±1μm**
- Corner machining control using UV OPT-drive system and CM3
- <Top surface of arbitrary shape up and down / Bottom surface of circle command>

**Circular accuracy within 2μm**
- Wire electrode: ø0.21 (.008")/BS
- Workpiece: Steel(SKD11), t130mm (1.2")

**Power consumption reduced up to 69%**
- Conventional model
  - MV-S
  - MV-R
  - Reduced 55%
  - Reduced 69%
  - Reduced 69%
- *Compared to conventional Mitsubishi Electric Wire-cut EDM (FA Series)*

**Defends machines against the threat of computer viruses (LAN, USB)**
- Measures against internal threats
- Measures against conventional threats
- Measures against new threats
- Measures against business risk
Advanced manual control box / Standard manual control box
The advanced manual control box has an LCD display, and can be used for positioning, zero set and AT operations.

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

Angle Master ADVANCE II (jig)
Measuring jig to be used for Angle Master ADVANCE II (S/W)
Use for taper degree calculation in UV axis directions.

Wire processing unit
Spent wire electrode is cut at the discharge section.

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

3-color warning light
Indicates machine operating status.

Run timer
Indicates accumulated machining time.

LED light
High-brightness LED lighting.

Workpiece clamp set
Clamp jigs dedicated for use in holding workpieces.

Options

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

20kg (44.1 lb)/25kg (55.1 lb) wire spool unit
Long-time continuous machining is possible.

465x396 to 546x678 Angle Master ADVANCE II
2
(jig)
Measuring jig to be used for Angle Master ADVANCE II (S/W)
Use for taper degree calculation in UV axis directions.

Standard manual control box
Advanced manual control box
4-piece filter system
3-color warning light
Run timer
LED light
Workpiece clamp set
Tools (tool box)
25
Options and retrofit specifications differ according to country and region; please contact a Mitsubishi Electric representative for details.

<table>
<thead>
<tr>
<th>Option name</th>
<th>MV1200R</th>
<th>MV1200S</th>
<th>MV2400R</th>
<th>MV2400S</th>
<th>MV2400S (column-up specifications)</th>
<th>MV4800</th>
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<td>UV OPT-drive system specifications</td>
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<td>ø0.05 (0.020&quot;) Y, ø0.07 (0.003&quot;) Y automatic wire threading*</td>
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<td>for processing-resistant materials</td>
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<td>Angle Master guide kit ø0.2 (0.008&quot;) (ø30&quot;)*</td>
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<td>Angle Master (S/W)*</td>
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<td>Angle Master ADVANCE® (S/W)*</td>
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<td>Angle Master ADVANCE® (measuring jig)*</td>
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</table>

WIRE-CUT EDM AUTOMATION SYSTEM

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

WIRE-CUT EDM AUTOMATION SYSTEM

DNC

Data transmission

LAN/W (standard)

Use EDM’s Explorer and receive data in the common HDD on the EDM side. After that, data I/O operations are required.

FTP

Data can be received only using data I/O operation.

LAN/W (standard)

The personal computer’s Explorer and the EDM’s common HDD are used. After that, data I/O operations are required for the EDM.

DNC

Commercially available DNC software must be installed on the personal computer side. Refer to DNC specifications operation for details.

* Please contact a Mitsubishi Electric representative for details.

Network connection specifications (DNC, FTP Options)

Data, such as NC programs, machining conditions and variables can be exchanged between a personal computer and EDM.

The required options differ according to the models and purpose, and can be confirmed using the following table.

One IP address must be prepared for each EDM within the user’s in-house network.
Power Supply, Control Specifications/Machine Installation

### Power Supply/Control Specifications

#### Control Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>MV1200R</th>
<th>MV1200S</th>
<th>MV2400R</th>
<th>MV2400S</th>
</tr>
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<tbody>
<tr>
<td>Compatible model</td>
<td>WMV(R)</td>
<td>WMV(S)</td>
<td>WMV(R)</td>
<td>WMV(S)</td>
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<tr>
<td>Power supply unit specifications</td>
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<td>Model</td>
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<td>Power supply circuit</td>
<td>Regenerative transistor pulse type</td>
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<td>Cooling method</td>
<td>Completely sealed/Indirect cooling</td>
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<tr>
<td>Anti-electrolysis power supply</td>
<td>All modes</td>
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<tr>
<td>Maximum output current</td>
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<td>Power supply mode</td>
<td>9 types : Anti-electrolysis power supply</td>
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<td>Machine voltage selection</td>
<td>16 types</td>
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<td>Machining setting</td>
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<td>OFF time</td>
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<td>Stabilization circuit E</td>
<td>5 types</td>
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<td>FM circuit (LA, LC)</td>
<td>2 types</td>
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<tr>
<td>PM control</td>
<td></td>
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<tr>
<td>3 notches (changeable with M code or screen)</td>
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<td>Workpiece material: Steel, tungsten, copper, aluminum</td>
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<tr>
<td>AVR</td>
<td>Built-in</td>
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<tr>
<td>Unit dimensions (mm)</td>
<td>600 × 650 × 1765 (23.6 × 25.6 × 69.5)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit weight (kg)</td>
<td>240 (529)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Control Unit Specifications

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>NC program input method</td>
<td>Keyboard, USB flash memory, Ethernet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Display</td>
<td>15&quot; color TFT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Display characters</td>
<td>Alphanumeric characters</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control method</td>
<td>CNC closed loop</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of control axes</td>
<td>Max. 4 axes simultaneously</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Setting unit</td>
<td>X, Y, U, V, Z, ... 1/0.1µm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum driving unit (mm)</td>
<td>500nm (0.000050mm (0.000002&quot;))</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. command value</td>
<td>±9999.99999mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Position command format</td>
<td>Combined use of increment/absolute values</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interpolation function</td>
<td>Linear, circular, and spiral</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scale magnification</td>
<td>0.00001 – 99.9999999 (G code) 0.001 – 9999.999 (S code)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Optimum feed control</td>
<td>Automatic selection of machining speed according to gap voltage sensing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Path-retrace control</td>
<td>Reverse path retrace during short-circuit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wire offset</td>
<td>±9999.99999mm Offset numbers: 1 to 900 (intersection point calculation)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basic screen menu</td>
<td>5 types (file, setup, machining support, monitor, maintenance)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Automatic 2nd cut</td>
<td>Interactive screen method</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machining condition (E-pack) storage</td>
<td>1 to 6999</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program number command</td>
<td>1 to 99999999</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sub-program</td>
<td>Nesting level 30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sequence numbers</td>
<td>1 to 9999</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manual input positioning</td>
<td>Input on screen</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manual operation box</td>
<td>High-speed, medium-speed, low-speed, ultra-low speed, inching (0.001mm/0.005mm/0.001mm) Positioning function, AT function</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graphics</td>
<td>XY plane, XY-XZ plane, solid, table scaling, 3D model display, background drawing, automatic machining path drawing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>User memory capacity</td>
<td>1GB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintenance function</td>
<td>Management of consumable parts (time display)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adaptive control</td>
<td>SL, CM, EM, OM, PM, BM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>External dimensions (mm)</td>
<td>494 × 175 × 346 (19.4 × 6.9 × 13.6) (excluding keyboard and mouse pad)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>20 (44)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Control Unit Functions

<table>
<thead>
<tr>
<th>Feature</th>
<th>W31 (ADVANCE control unit) control unit functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year, month, date display</td>
<td>Reference block</td>
</tr>
<tr>
<td>Overlap window function</td>
<td>Single block</td>
</tr>
<tr>
<td>Character string replacement function</td>
<td>Dry run</td>
</tr>
<tr>
<td>Geometric function</td>
<td>Automatic return</td>
</tr>
<tr>
<td>Floating decimal point function</td>
<td>User macro</td>
</tr>
<tr>
<td>Graphics</td>
<td>Automatic positioning (hole center, edge)</td>
</tr>
<tr>
<td>Control command</td>
<td>Automatic zero point return</td>
</tr>
<tr>
<td>Corner R</td>
<td>Automatic corner chamfer</td>
</tr>
<tr>
<td>Corner chamfer</td>
<td>Machining start hole return</td>
</tr>
<tr>
<td>Linear arrow command</td>
<td>Memory operation 1GB</td>
</tr>
<tr>
<td>3D axis short-circuit stop</td>
<td>Program edit</td>
</tr>
<tr>
<td>Simultaneous 2-axis wire alignment</td>
<td>Coordinate rotation (K)</td>
</tr>
<tr>
<td>Workpiece inclination compensation</td>
<td>Pattern rotation (K)</td>
</tr>
</tbody>
</table>
Machine installation checklist

Determining the machining details
Check each item, and make sure that no item or order is overlooked.
1. Determine the workspace
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 fixture
2. Prepare or manufacture the fixtures

Preparation of consumable parts
1. Purchase consumable parts such as wire electrodes

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. Foundation
3. Confirmation of installation floor
4. Confirmation of foundation floor

Note that delivery may not be possible in some cases depending on the dimensions.

Installation conditions

1. Installation site
   - Constant-temperature dust-proof room
     - Recommended room temperature 20±1°C (68±2°F)
     - Usable temperature range 5°C to 35°C (41°F to 95°F)
     - Temperature fluctuation will directly affect machining accuracy. To maintain performance accuracy, select a place with minimal temperature fluctuation.
     - Install the EDM in a constant-temperature room when performing high precision machining, even when using skim cuts.
     - Note that an environment where the temperature fluctuates by 3°C (5°F) or more within 24 hours, or 1°C (2°F) or more within one hour can adversely affect machining accuracy.
     - Make sure that the machine body is not subject to direct wind from air-conditioners or to direct sunlight.
     - Dust-free location is recommended.
     - Install a wire-cut EDM in an environment with no corrosive gases, such as acid or salt, or mist, and with low levels of dust.
     - Grinding dust can adversely affect the machine’s linear scales and ball screws. Pay special attention to installation location to avoid this hazard (separate from machine, or install in separate room, etc.).
     - Humidity: Within 30% to 75% (with no dew condensation).
     - Temperature range during transportation and storage
       - From -25°C to 55°C (13°F to 131°F) (when power is not connected).

   - Wire electrodes
     - Select the wire electrodes and operators
     - Preparing consumable parts such as wire electrodes

2. Machining heating value
   - Primary wiring
     - 3 phase 30/50Hz 10% 60Hz, 3-phase 200V 10% 60Hz
     - Power capacity 13.5kVA (during normal use) (when using 20.2/687 mm wire electrode)

3. Power-supply equipment
   - Primary wiring
     - Hose diameter: 1/4 inch (hose sleeve outer diameter: ø9.0 (0.355))
     - Pressure: 0.5 to 0.7MPa (7 to 101 psi)
     - Flow rate: 75/min or more (380cu.mm/min)
     - Air (compressed air) is used to operate the automatic wire feeder and work tank door, etc. Air supplied from a normal compressor contains various impurities that could cause operation faults if they get into the pneumatic devices such as the solenoid valve. Install an air filter with a drainage discharge mechanism, etc., in the air source (primary source) piping to prevent impurities from entering the pneumatic devices.

4. Grounding work
   - Grounding work is necessary to prevent malfunctions caused by 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 45mA passes through the filter. A highly sensitive earth-leakage breaker (sensitivity current 30mA) could malfunction. Thus, a medium-sensitivity earth-leakage breaker (sensitivity current 100 to 200mA) is recommended for the wire-cut EDM. Class C grounding (grounding resistance of 100 or less) is recommended for the wire-cut EDM. Even if the sensitivity current is 200mA, the contact voltage will be 2V or less, and no problems will occur in preventing electric shock (application of tolerable contact current Class 2, 25V or less).

   - Grounding the wire-cut EDM to the shield room's grounding terminal (through bolt) as shown in Fig. 4.

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

Precautions for selecting earth-leakage breaker

To prevent malfunctions caused by the external noise from control units, etc., a filter is installed for the power-supply input. By grounding one end of this filter, an earth-leakage current of approx. 30 to 45mA passes through the filter. A highly sensitive earth-leakage breaker (sensitivity current 30mA) could malfunction. Thus, a medium-sensitivity earth-leakage breaker (sensitivity current 100 to 200mA) is recommended for the wire-cut EDM. Class C grounding (grounding resistance of 100 or less) is recommended for the wire-cut EDM. Even if the sensitivity current is 200mA, the contact voltage will be 2V or less, and no problems will occur in preventing electric shock (application of tolerable contact current Class 2, 25V or less).

Disposal

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

Harmonic distortion

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

Wire electrodes

Use the following wire electrodes

- OB-FN (ø1.185 - ø3.85)
- Musline Cable
- NSS-FN (ø1.85 - ø3.85)
- Hitachi cable
- SWP-SP (ø0.65 - ø0.75/SP)
- Suzuki Metal Industry

The wire electrodes shown above do not guarantee performance.

Recommended sliding surface lubricants

Use one of the following lubricants for sliding surface

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Product name</th>
</tr>
</thead>
<tbody>
<tr>
<td>ExxonMobil</td>
<td>Metal DTE26</td>
</tr>
<tr>
<td>Idemitsu</td>
<td>Super Hydro 68A</td>
</tr>
<tr>
<td>Showa Oil</td>
<td>Terrax Oil 68</td>
</tr>
<tr>
<td>JX Nippon Oil &amp; Energy</td>
<td>Super Molyde DX58</td>
</tr>
</tbody>
</table>

Terms of warranty

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

2. Coverage
   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:
   - When a failure occurs that was caused by a machine modification that directly affects the machine’s functioning or accuracy.
   - When a failure occurs caused by the use of non-standard parts, consumables or lubricants.
   - When a failure occurs caused by a natural disaster such as lighting, earthquake, storms and flooding.
   - When the use of non-recommended consumables or aftermarket parts are used such as filters or flushing nozzles.

   Please be aware that any workplace/environmental closure and operation loss which may be associated with any fault of our machine are not covered by this warranty.

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

* Not all models are supported for all countries and regions.
* Machine specifications differ according to the country and region, so please check with your dealer.
* Processing data provided in this brochure is for reference only.