



**DASNY**

# **SECTION A**



BID NO.:609

PROJECT NAME & LOCATION SUNY Broome  
907 Front Street  
Binghamton, New York

Description: Furnish & Deliver Mitsubishi Equipment

Bid Open Location: DASNY  
515 Broadway, Albany, NY 12207

Bid Open Date: June 7, 2018

Bid Open Time: 2:30PM

Contact: Kristen Costello (518) 257-3119

### NOTICE TO BIDDERS

#### **MAIL BIDS EARLY**

Sealed bids will be received by DASNY at the above address for the items listed in the attached Bid Breakdown and Schedule. When submitting your bid you must:

1. Prepare your bid on the attached Bid Breakdown and Schedule. Return one signed original of the Bid Breakdown and Schedule
2. If your bid deviates from Specifications, explain such deviations or qualifications on your letterhead, setting forth therein such explanations, and attach them to the Bid Breakdown and Schedule.
3. Submission of a bid constitutes full knowledge and acceptance of all provisions of the Notice to Bidders, all information referenced in the General, Supplemental and Detailed Specifications, the Bid Submission and any Supplemental General Requirements contained herein, as well as any addenda issued in relation to the Invitation for Bids.
4. Each bid shall bear on the outside of the envelope the name of the bidder, address, telephone number and designated as a bid for the following:  
DASNY Bid No. 609 - Furnish & Deliver Mitsubishi  
Equipment-Bid Opening Date: June 7, 2018 @ 2:30PM  
Return to:  
DASNY  
Attn: Purchasing Unit  
515 Broadway  
Albany, NY 12207-2964



Bid No.: 609

When a sealed bid is placed inside another delivery jacket, the bid delivery jacket must be clearly marked on the outside “**BID ENCLOSED**” and “**ATTENTION: PURCHASING UNIT**”. The Dormitory Authority will not be responsible for receipt of bids which do not comply with these instructions.

5. Mail bid responses early in order for them to be received before the time of the bid opening. **Late bids will be automatically rejected.** Individuals submitting bids in person or by private delivery services should allow sufficient time for processing through building security to assure that the bids are received prior to the deadline for submitting bids. All individuals who plan to attend bid openings will be required to present government-issued picture identification to building security officials and obtain a visitor’s pass prior to attending the bid opening.
  
6. In accordance with State Finance Law § 139-j and 139-k, this solicitation includes and imposes certain restrictions on communications between Dormitory Authority personnel and an Offerer during this procurement process. Designated contact for this solicitation is: Kristen Costello, Sr. Purchasing Coordinator , at Dormitory Authority – State of New York, 515 Broadway, Albany, NY 12207, (518) 257-3119. Contacts made to other Dormitory Personnel regarding this procurement may disqualify the Offerer and affect future procurements with governmental entities in the State of New York. Please refer to the Authority’s website [www.dasny.org](http://www.dasny.org) for Authority policy and procedures regarding this law, or the NYS office of General Services website [www.ogs.ny.gov/BU/PC/](http://www.ogs.ny.gov/BU/PC/) for more information about this law.



Bid No.: 609

**If you are not submitting a bid it is requested that you complete and return the lower portion of this form**

*(Please check all that apply and provide comments in the space provided, if necessary)*

- We are not Submitting a bid.
- We Request removal of our name from the mailing list.
- Location of the job site.
- Commodity is not carried by our company.
- Scope is too large.

Other/Additional Explanation: \_\_\_\_\_  
\_\_\_\_\_

NAME OF BIDDER: \_\_\_\_\_

ADDRESS : \_\_\_\_\_

Street Telephone	City	State	Zip
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\_\_\_\_\_  
Signature of Bidder

\_\_\_\_\_  
Official Title

## CLAUSES PURSUANT TO THE OMNIBUS PROCUREMENT ACT OF 1992

It is the policy of New York State to maximize opportunities for the participation of New York State business enterprises, including minority and woman-owned business enterprises as bidders, subcontractors and suppliers on its procurement contracts.

Information on the availability of New York subcontractors and supplies is available from:

Empire State Development  
Small Business Division  
30 South Pearl Street, 7<sup>th</sup> Floor  
Albany, NY 12207  
Phone: (800) 782-8369

A directory of minority and woman-owned business enterprises is available from:

Empire State Development  
Division of Minority and Women Business Development  
30 South Pearl Street  
Albany, NY 12207  
Phone: (518) 292-5250

Online Directory: <https://ny.newnycontracts.com/FrontEnd/VendorSearchPublic.asp>

DASNY maintains a directory of minority and women-owned business enterprises:  
<http://www.dasny.org/construc/mwsberreg/index.php>

The contractor acknowledges notice that New York State may seek to obtain offset credits from foreign countries as a result of this contract and agrees to cooperate with the State in these efforts.

DASNY encourages the use of recycled Materials in the manufacturing process. To that end, the recycled product must meet the same codes, specifications and standards the non-recycled materials do, including requirements for cost, installation, aesthetics, availability and maintenance.

The Omnibus Procurement Act of 1992 and § 2879 of the NYS Public Authorities Law require that by signing this bid, contractors certify that whenever the total bid amount is greater than \$1 million:

1. The contractor has made reasonable efforts to encourage the participation of New York State Business Enterprises as suppliers and Subcontractors on this project, and has retained the documentation of these efforts to be provided upon request to the State. If the contractor determines that NYS business enterprises are not available to participate on the contract as subcontractors or suppliers, the contractor shall provide a statement indicating the method by which such determination was made. If the contractor does not intend to use subcontractors, contractor shall provide a statement verifying such;
2. The contractor has complied with the Federal Equal Opportunity Act of 1972 (PL 92-261), as amended;
3. The contractor agrees to make reasonable efforts to provide notification to New York State residents of employment opportunities on this project through listing any such positions with the Job Service Division of the New York State Department of Labor, or providing such notification in such manner as is consistent with existing collective bargaining contracts or agreements. The contractor agrees to document these efforts and to provide said documentation to the State upon request;

**DASNY is required by law to notify the NYS Department of Economic Development of any procurement contract for one million dollars or more that is to be awarded to an out-of-state vendor. This notice must be done simultaneous to the notification of award provided to the vendor. A purchase order or contract cannot be issued until fifteen (15) days after such notification is provided.**



**DASNY**

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## GENERAL SPECIFICATIONS

- (1) The enclosed Purchasing General Conditions are hereby incorporated by reference. Submission of a bid response shall constitute acceptance of such conditions. Any exceptions/clarifications/qualifications to these conditions or other specifications and/or requirements contained herein must be clearly stated in the bid response and, depending upon the nature of such, may be grounds for rejection of your bid.
- (2) Bids must be submitted in the bidder's full legal name, or the bidder's full legal name plus a registered assumed name, if any.
- (3) All NYS bidders are required to be registered to do business with the NYS Department of State or their local County Clerk, whichever is applicable.
- (4) All out-of-state bidders will be required to provide proof of registration to do business in their state. All out-of-state bidders that "do business in New York State" **MUST BE REGISTERED WITH THE NYS DEPARTMENT OF STATE**. Please contact the NYS Department of State at (518) 473-2492. Information is available at the DOS website: [www.dos.ny.gov](http://www.dos.ny.gov)
- (5) DASNY is required by law to notify the Empire State Development of any procurement contract for one million dollars or more that is to be awarded to an out-of-state vendor. This notice must be done simultaneous to the notification of award provided to the vendor. A purchase order or contract cannot be issued until fifteen (15) days after such notification is provided.
- (6) Empire State Development is required by law to identify states and other jurisdictions that impose preferences or other penalties against New York bidders. DASNY is precluded from soliciting bids or entering into procurement contracts with companies that have their principal place of business located in one of the listed jurisdictions, unless the procurement is for a product that is substantially manufactured in New York State or the services are to be performed in New York State. Currently, this list of jurisdictions includes the states of Alaska, Hawaii, Louisiana, South Carolina, West Virginia and Wyoming.
- (7) Unless otherwise indicated, any reference to brands or model numbers is intended to establish a standard. Items of all manufacturers will be considered, provided the item is determined to meet or exceed the required specification. DASNY's decision as to whether a substitute item meets specification will be final. Your attention is directed to Article II-7, Page 5 of the General Conditions. In order to evaluate substitute items, detailed specifications must be submitted for any product that is other than the one(s) specified in the bid.



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## GENERAL SPECIFICATIONS CONTINUED

- (8) Unless otherwise noted, guarantee on all items is to be one year as detailed in Article XVI of the General Conditions
- (9) All upholstered furniture and drapery panels and lining must meet strict flammability requirements. Standards applicable to this bid, if any, will be delineated in the Detailed Specifications.
- (10) LABOR/TRADES - Any labor, materials or means whose employment, or utilization during the course of this contract, shall not in any way cause or result in strike, work stoppages, delays, suspension of work; or similar troubles by workers employed by this contractor or his subcontractors, or by any of the trades working in or about the buildings and premises where work is being performed. Any violation by the contractor of this requirement may in the sole judgment of DASNY be considered as proper and sufficient cause for declaring the contractor to be in default, and for the owner to take action against him as set forth in the Purchasing General Conditions, Article VIII, "Termination", or such other action as DASNY may deem proper.
- (11) Bid results are available on the DASNY website ([www.DASNY.org](http://www.DASNY.org)). Bid results will not be given over the phone.
- (12) If you are a NYS Certified Minority or Women Owned Business, please include a copy of your certification with the bid.





**DASNY**

**ANDREW M. CUOMO**  
Governor

**ALFONSO L. CARNEY, JR.**  
Chair

**GERRARD P. BUSHELL, Ph.D.**  
President & CEO

## SUPPLEMENTAL SPECIFICATIONS

**The following items are attached for informational purposes. Referenced documents need not be returned with the proposal.** These documents are only applicable to the successful bidder and the ensuing procurement contract. Documents are only applicable to the successful bidder and the ensuing procurement contract. Documents applicable to the procurement that will result from this Invitation for Bids are designated by a check box (☒). Unless otherwise indicated, the referenced documents are located at the end of this Invitation for Bids.

- Purchasing General Conditions** – The DASNY Purchasing General Conditions contains terms and conditions of purchases made by DASNY. It is recommended that this document be reviewed fully.
- M/WBE Utilization Plan and Request for Waiver** - Minority and Women-Owned Business Enterprise (M/WBE) goals for this project are 0% and 0%, respectively. The successful bidder shall be required to complete a Utilization Plan or Request for Waiver, to be approved by DASNY’s Opportunity Programs Group. Reference Purchasing General Conditions, Article XIX, Affirmative Action for Contracts Mr. Michael Clay, DASNY Opportunity Programs Group at (518) 257-3464, is available to assist all bidders in attaining these goals. *Reference the enclosed “Good Faith Efforts Guidelines”.*
- Supplemental General Requirements** – Attached (if applicable) are the Supplemental General Requirements (SGRs) which provide important logistical information and additional conditions which govern this procurement. Please read these SGRs carefully.
- Form of DASNY Contract** – The procurement resulting from the Invitation for Bids will be executed through a DASNY purchase order and a related contract. The contract executed with the successful bidder will be in the same substantial form as the attached “Form of Contract”. Note that this Invitation for Bids and any response to such will be annexed as binding terms of the purchase agreement.
- Certificate of Insurance** (*sample enclosed*) – The successful bidder will be required to provide a Certificate of Insurance pursuant to Article XIV of the enclosed Purchasing General Conditions. The certificate shall name DASNY and other designated parties as additional insureds.

**CORPORATE HEADQUARTERS**  
515 Broadway  
Albany, NY 12207-2964

T 518-257-3000  
F 518-257-3100

**NEW YORK CITY OFFICE**  
One Penn Plaza, 52nd Floor  
New York, NY 10119-0098

T 212-273-5000  
F 212-273-5121

**BUFFALO OFFICE**  
539 Franklin Street  
Buffalo, NY 14202-1109

T 716-884-9780  
F 716-884-9787

**DORMITORY AUTHORITY STATE OF NEW YORK**

**WE FINANCE, BUILD AND  
DELIVER.**

[www.dasny.org](http://www.dasny.org)



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**SUPPLEMENTAL SPECIFICATIONS CONTINUED**

- Worker’s Compensation / Disability Insurance** – The successful proposer will be required to provide specific documentation with respect to Worker’s Compensation and Disability Insurance pursuant to Article XIV of the enclosed Purchasing General Conditions. Requirements are detailed in the enclosed “Workers’ Compensation and Disability Benefits Requirements” document.
  
- Prevailing Wage Schedule** – NYS Labor Law requires all wages paid by contractors and subcontractors on public work projects be paid at the prevailing wage rates. Enclosed is the current rate schedule for the appropriate county. Contractors and Subcontractors are responsible for obtaining current rates throughout the course of the project. The NYS Department of Labor (NYS DOL) updates these rates on July 1st of each year. Current rates can be obtained on the NYS DOL website ([www.labor.state.ny.us](http://www.labor.state.ny.us)) or by fax at (518) 485-1870. Note that an executed Contractor and Subcontractor Certification and certified payrolls, which include the hours and days worked by each workman, laborer or mechanic, the occupation at which he worked, the hourly wage rate paid and the supplements paid or provided, must be submitted with each and every payment requisition. **DASNY will not process an invoice without this information.** Forms are available on the DASNY website:  
<http://www.dasny.org/construc/forms2/vendors.php>
  
- Labor and Material Payment Bond** – The successful bidder must be prepared to provide surety bonds prior to award in accordance with Article XIV of the DASNY Purchasing General Conditions. The costs of these bonds are to be separately stated in the total bid price as indicated on the Bid Breakdown and Schedule.
  
- Performance Bond** – The Successful bidder must be prepared to provide surety bonds prior to award in accordance with Article XIV of DASNY Purchasing General Conditions. The costs of these bonds are to be separately stated in the total bid price as indicated on the Bid Breakdown and Schedule.
  
- Standard Vendor Responsibility Questionnaire (SVRQ)** – The successful proposer, in accordance with Article XXII of DASNY Purchasing General Conditions, will be required to complete the enclosed SVRQ. The award of a contract will be subject to a review of the information contained in these forms.

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**SUPPLEMENTAL SPECIFICATIONS CONTINUED**

- NYS Uniform Contracting Questionnaire (UCQ)** – The successful proposer will be required to complete the enclosed UCQ. The award of a contract will be subject to a review of the information contained in these forms.
  
- DASNY Contractor and Consultant Questionnaire (CCQ)** – The successful proposer will be required to complete the enclosed CCQ. The award of a contract will be subject to a review of the information contained in these

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# DETAILED SPECIFICATIONS

## MACHINE FEATURES

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- **Compact Highly-Rigid Machine Design** using CAE (computer aided engineering) guarantees increased accuracy and repeatability through increased casting foot print size and mass.
- **Moving Column Design** allows for greater workpiece weight capability and easier loading / unloading of workpieces. This is accomplished through the use of a unique combined axis linear motion way system that supports X and Y-axis in the same guide block.
- **Direct Drive Ball Screws and Linear Motion Guide Ways** insure proper support and accurate head movement in the X, Y, and Z-axis.
- **New Z-Axis Design** provides excellent positioning accuracy during high-speed jump machining.
- **The Newly Designed AC Smart Servo Drive System** allows unexcelled cutting accuracy and high speed positioning with a 0.05 $\mu$ m motor resolution.
- **Standard Work Tank Model** is available with a with swing front door access.
- **Three-Sided Drop Tank Model** provides many additional benefits.
  - Finer step height control provides half inch incremental steps.
  - Fast fill/drain keeps the tank height and fluid level constant.
  - New drive system provides smoother/faster tank operation.
  - Easy access for automation.
- **New Easy Access Filter System** is now located at the back of the machine which helps to reduce the required floor space.
- **New High-Inertia Style C-Axis** now provides a highly-rigid high-accuracy system that allows flushing through the head. Constant rotation burning capability of from 1 to 30 RPM is possible.
- **Dielectric Fluid Requirement** is reduced 25% compared to Mitsubishi conventional EDM machines.
- **New Power Supply/Control Design** provides a easy to maintain unit for years of cost saving operation.

## MITSUBISHI M700 SERIES PC CONTROL FEATURES

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- **M700 Series Control** now offers 15" LCD display, touch panel, Keyboard and mouse designed with ease of use in mind (Ergonomics). Utilizing a Windows 7 Embedded operating system it includes an 80GB hard drive with a 1GB partition for user program storage.
- **Program Input Methods** Keyboard, (2) USB Flash Memory, and Ethernet with FTP standard.
- **"Fuzzy Pro Plus" Control System** offers unparalleled jump speed, safety and ease of operation regardless of an operator's experience. This control system combines three basic elements managed by the "Fuzzy" process.
  - **"Fuzzy-Logic"** eliminates the need to manually adjust machining conditions while machining is in progress.
  - **"Fuzzy Pro"** uses a state-of-the-art sensor system to monitor the total amount of electrode contact area with the workpiece. The system automatically changes power settings according to the results of the measurement. The system also adjusts the initial settings to produce the most efficient burn.
  - **"Fuzzy Pro 3 Plus"** provides enhanced machining performance with Optimum High-Speed Jump and Expert Rib machining settings to dramatically improve no-flush machining conditions.
- **Easy, Simple, Programming by Expert System (E.S.P.E.R.)** a new programming system that allows ...
  - Selection of machine conditions and burn process.
  - Electrode compensation and alignment.
  - Workpiece set-up and location.
  - Artificial Intelligence (AI).
  - Selection of initial machining conditions.
  - Rating of machining process (wear, speed, and precision, all equal in combinations).
- **E.S.P.E.R. II Navigator** now simplifies programming inputs to a short question and answer session prompting the operator through the process.
- **C-Axis-Linked Orbital Rotation** allows the orbital pattern to be linked to the rotation angle of the C-axis.
- **3 Dimensional Lateral Servo** including spherical, rib or tapered shapes

**MITSUBISHI M700 SERIES PC CONTROL FEATURES-continued**

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- **Billable cutting hours are increased** and non-cutting machine hours are reduced because...
  - **New SS Jump 5** optimizes jump up and acceleration control to stabilize High-Speed NO-FLUSH machining. New jump speeds are 590"/min in Z and 197"/min in the X and Y axis. This system gets the electrode back into the part quickly improving burn efficiency, particularly during small rib no-flush type burns.
  - **New Orbit-Pro System** creates a semi-free electrode orbit pattern reducing finishing time and electrode wear by varying the speed of the orbit in relation to the remaining stock in the cavity. More consistent side wall and bottom finish is made possible with this process.
  - **High Speed Positioning** and plotting increases machine efficiency
  - **Automatic Alignment** and pick-up routines (built into the control) and "Walk Around" Pendant Control significantly reduces workpiece set-up time.

**POWER SUPPLY**

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- **New FP80S** power supply provides high performance machining capabilities and ease of use.
- **IDPM (Intelligent Digital Power Master) Adaptive Control** uses a detecting discharge pulse to reduce abnormal discharges which reduces graphite electrode wear by as much as 40%.
- **FP2 (Fine Pulse) Power Supply** with the new PS circuit will ...
  - Reduce finishing time, especially in large electrode applications
  - Reduce wear
  - Improve machining stability
  - Improve surface finish
  - Improve overall speed dramatically
- Provides conditions for 6300 individual machining settings (E-Packs)
- Provides conditions for 200 complete machining programs (Master Packs)
- Patented ∞SC Circuit (Slope-Control) modifies the shape of the wave-form to provide extremely low wear of copper electrodes -- 0.1% or less (Cu- St)
- Transistor Pulse (TP), Ultra-Low Wear Slope Control (SC), Super Matte Large Area Finish (PS), Narrow Gap control, and Mirror-Finish (GM) Circuits are all included as standard equipment

<b>TYPE FP80S / POWER SUPPLY SPECIFICATIONS</b>	
Power Requirements	3 phase 180/480 VAC
	60 Hz
FP80S (w internal transformer)	6.5kVA Total Machine Usage
Maximum Output Current	80 amps (peak)
Power Supply Circuit System	Transistorized Pulse Circuit
<b>TRANSFORMER REQUIREMENTS</b> (if 3 phase 200/220VAC cannot be supplied)	
SP Carbide Machining Circuit: requires external transformer	

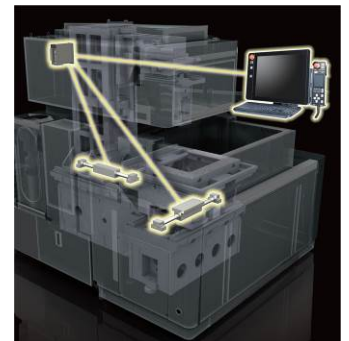
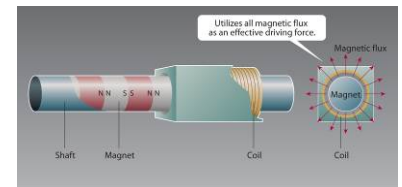
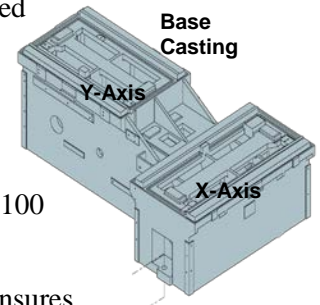


**EA8S ADVANCE Specifications**

Machine Unit	Machine Type	EA8S Advance
	X-axis stroke (inch)	11.8
	Y-axis stroke (inch)	9.8
	Z-axis stroke (inch)	9.8
	Work Tank internal dimensions (W x D x H) (inch)	31.5 x 20.5 x 11.8
	Dielectric fluid level (Max/Min)	3.4 / 9.8 (inch)
	Work tank access	Swing Door / 3-Sided Drop Tank
	Rapid fill / drain	Auto (std)
	Table dimensions (W x D) (inch)	19.7 x 13.8
	Max. workpiece weight (lb.)	1,214
	Max. electrode weight (on platen) (lb.)	55
	Table to electrode mounting surface (Max/Min) inch	5.9/ 15.7
	Floor to table level distance (inch)	35
	Machine structure	Fixed table / Traveling Column
	Rapid travel speed (inch / min.)	78.74
	Min. command input	.0001mm / .00001"
	Min. drive resolution	.00005mm / .000002"
	Drive motor type	Intelligent AC servo
	Motor coupling type	Direct drive
	Positioning detector	Rotary Encoders
Machine system dimensions (W x D x H) (inch)	60.2 x 78.7 x 82.9	
Machine weight, including power supply (lb.)	4,400	
Power Supply	Type	FP80S
	Machining current: Peak	80
Control Unit	Program support function	E.S.P.E.R. II
	Machining function	Fuzzy Pro 3-Plus/Orbit Pro
	Graphic display	15" color LCD Touch Screen
	CPU / type	M700 Series PC
Dielectric Fluid System	Reservoir capacity (gal)	69
	Filtering method	Paper cartridge (1pc)
	Temperature control type	Chiller FTS (Standard)
Machine Layout	Floor space requirement (with access clearance) (inch)	97.9 x 96.8
Automatic Tool Changer (ATC)	Standard Tank: Shuttle Type:	
	3R Combi/MACRO / EROWA--- Positions Available	7/4/4
	3-Sided Drop Tank:	
	LS Type (electrodes need to be balanced) --- Pos. Available	10/20
	3R Combi Jr./MACRO Combi / MACRO & EROWA (lb.)	5.5 / 11 / 22
	MVH Type --- Positions Available	20
C-Axis	MACRO & EROWA (lb.)	22
	Max. electrode weight (Manual Change) (lb.)	55
	Max. RPM	1~30
	Min. indexing angle	.001°
	Min. drive unit	.001°

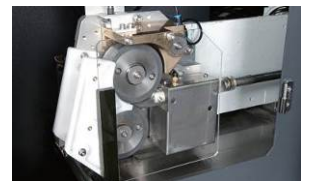
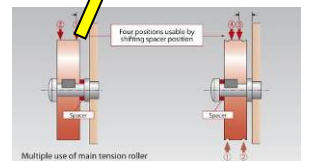
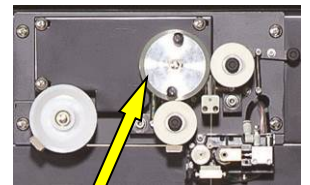
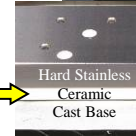
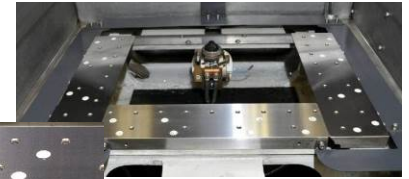
## MACHINE FEATURES

- **Submerged Machining** to 8.7 inch in the all-new, stainless steel work tank with the newly designed self-cleaning stainless steel seal plate and seal plate movement transfer mechanism.
- **Automatic Level Control** sets the DI fluid level to the correct height according to the Z-axis position.
- **Vertical Movement Machining Tank Door** uses a unique, space saving door designed to operate in two easy motions without removing your hands from the door. It is also equipped with a safety switch that will not allow a tank fill with the door open or ajar.
- **Fine Grain Dianite Casting Material** designed using CAE (computer aided engineering) increases casting thickness and height to guarantee accuracy and repeatability. The machine unit now weighs in at 5,952 lb.
- **Split-Axis Design** The X and Y-axis ways mount directly to the “T” shaped cast base moving the table in X and the column in Y providing the best in thermal stability and rigidity for handling workpiece weights of up to 1100 lbs.
- **AC-Servo (Closed Loop) Torque Control Wire Tensioning System** insures finer, more stable wire tensioning and increased part accuracy and consistency.
- **Linear Shaft Motors**, provide a noncontact zero wear drive system in X, Y axes that insures highly accurate table movement with zero backlash.
- **Linear Motion Guide Ways** support all the machine axes. The size, spacing and location of these ways promote stable operation throughout the entire machining range.
- **Optical Servo Drive System** uses all fiber optics between the control, servo amps and linear shaft motors providing 4x faster communications speed improving response time which allows unexcelled cutting accuracy and high speed positioning.
- **All-Axes Absolute Control System** enables high-accuracy positioning without returning to the zero point after a power failure.
- **Linear Glass Scales**, new (50nm) 2 millionths absolute scales, come as standard equipment on the X & Y axes.
- **U-V Taper Unit** allows up to 15° per side taper cutting in an 8.0" workpiece using standard ball screw drives. 45° per side is possible with optional wide-angle guides and flush cups.
- **Angle Master** Function provides a higher degree of taper accuracy by better matching the true bend point of the wire to the guide point in larger taper angles. (special guides & flush cups required).



## MACHINE FEATURES CONT.

- 3-Sided Three Piece Hardened Work Table** is a mid-hardness stainless steel designed to resist scratching and daily wear. This also increases toughness so the 8mm tapped holes can resist damage from over torquing of clamps or tooling.
- Ceramic Table Insulation** ensures improved surface finishing by reducing floating capacitance. This reduces the rise to start voltage required to make a spark improving fine spark efficiency.
- Automatic Wire Alignment** is made possible by a highly accurate wire alignment unit that mounts to the machine table and electronically shifts the U, V-Axis to make the wire perpendicular to the machine table.
- Wire Main Tensioning System** is designed to both apply breaking force to tension the wire as well as become the drive motor to push the wire through the system for automatic threading. TS Master is a DC motor operated tensioning system that automatically suppresses tension fluctuation reducing possible wire lines on the machined surface.
- Improved Main Tension Roller** is now designed with index and flip capability to provide four (4) separate traction surfaces to reduce operation costs.
- Large-Diameter Collection Rollers** improves the smooth operation of pulling the wire through the machine while providing multiple index locations to greatly reduce operational costs.
- Round Diamond Wire Guides** are used to provide the best accuracy for both straight and taper cutting applications. Both the upper and lower guides can be replaced simply by unscrewing the flush cups and then the guides.
- Reduced Maintenance** Several self-cleaning features, along with the Auto-Oiler, reduce maintenance time by as much as 90% over previous models.

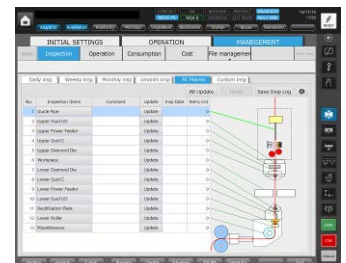
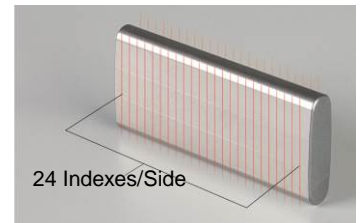
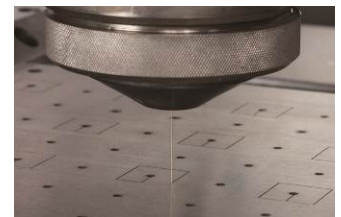
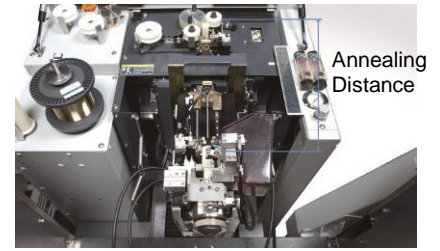


## INTELLIGENT AUTOMATIC THREADER (AT UNIT)



- **Automatic Wire Threading (AT)** has a new design that now provides 14 inches of annealed wire for more reliable threading through our unique solid round diamond guides, creating a highly reliable unit completely programmable from user screen or within the part program.
- **AT unit with the Quick Re-try Function** is highly reliable with wire sizes that range from .004" to .012" in either plain brass or with some coated high-speed wires (.010" standard).
- **Fine Hole Insert** allows the AT unit to insert wire into start holes as small as .020". Parameter adjustments can be made to prevent the wire from being inserted into a nearby hole.
- **Submerged Threading and Insert at Break-Point** is now possible up to 8 inches thick when using the wire-annealing feature that can be programmed from user screen or within the part program.
- **Contact Release** allows the machine to break contact between the wire and workpiece after insertion and reposition to an area where the EDM process can begin.
- **Upper and Lower Power Feeds** can be indexed up to 48 times each. Simply stop machining, release the lever-lock, index the carbides, close the level-lock, and resume machining.
- **One-Touch Lever Clamp Mechanism** allows quick easy Power Feed indexing locking it in place with repeatable torque, unlike systems that use set screws.
- **New Auto-AT Maintenance Pages** are set by the operator for total maintenance intervals. Complete maintenance instructions pop up on-screen when that value has been reached.
- **Location of the Wire Tip** is displayed in a real-time, on-screen graphic when the wire is inserted.
- **Automatically Adjusts Power Settings** when cutting materials with impurities or materials with high amounts of inherent stress, minimizing any repeated wire breakage problems.
- **Rough Cut and Skim Cut Operations** can be performed with one simple, unmodified program (Micro-joint, cutoff).
- **Ultra-Fast Fill and Drain** allows faster hole-to-hole threading cycle times.
- **10KG (22 lb.) Wire Spool Standard** allows up to \*40 hrs. of unattended machining time.

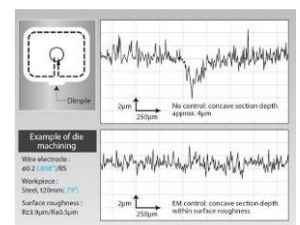
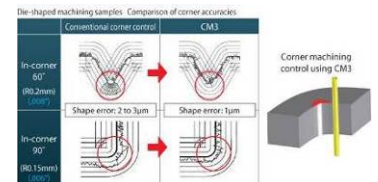
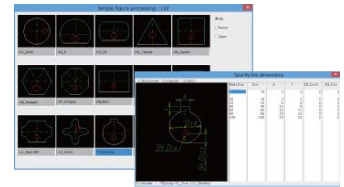
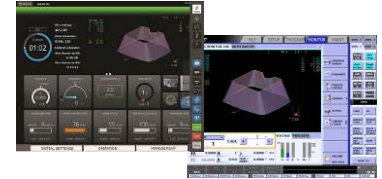
*\*Actual hours depend on wire speed and diameter*





## MITSUBISHI M800 SERIES PC CNC CONTROL

- M800 Series Control** now offers 19" LCD display, touch panel, Keyboard and mouse designed with ease of use in mind (Ergonomics). Utilizing a Windows 8 Embedded operating system and a CFAST Compact Flash Card provides a higher maximum data transfer rate providing the highest performance. A 1GB partition has been allocated for user program storage.
- Program Input Methods** Keyboard, USB Flash Memory, and Ethernet with FTP standard.
- 2D – CAM Programming** allows for DXF and IGES CAD files that can be imported directly for conversion to NC programs.
- Dual HMI** users can switch between the new control and previous generation control. For current Mitsubishi users allows for a zero learning curve.
- Onboard Programming Macros** allows for quick and easy program creation for the most common machine shapes. Reduce program operation time by 88%.
- Machine Restart** suspends the current program allowing the operator to start another job.
- Check List** allows a specific process or set of conditions to be followed before the machine will allow you to start. Ideal for aerospace and medical processes that have been validated.
- Fully Automatic Rough Machining Control** covers approach control (EM), corner control (CM-R), and power control (PM) will manage the complete rough cut with a few simple operator inputs.
- Corner Master Control** now provides 3 levels of control to increase corner precision during both the rough-cut and skim cut processes. CM-R uses an accuracy slide bar so the operator can select improved rough cut accuracy while sacrificing some speed. CM-S provides anti-short circuit control at small corners while balancing accuracy and machining speed. CM-S2 uses its own dedicated screen to allow fine adjustments in corner detail to provide our highest degree of corner accuracy.
- EM (Entrance Master) Control** reduces the small dimple created by the approach line on die shapes providing higher accuracy machining while reducing secondary handwork to remove the dimple.
- ADVANCED Pendant Control** automatic alignment and pick-up routines (built into the control) and "Walk Around" significantly reduces workpiece set-up time.
- Quick Response Servo System** eliminates machine stoppage due to short circuit. During a short circuit condition, the machining energy is reduced and the wire is "backtracked" along the wire path at 10 (ten) times the machining speed.



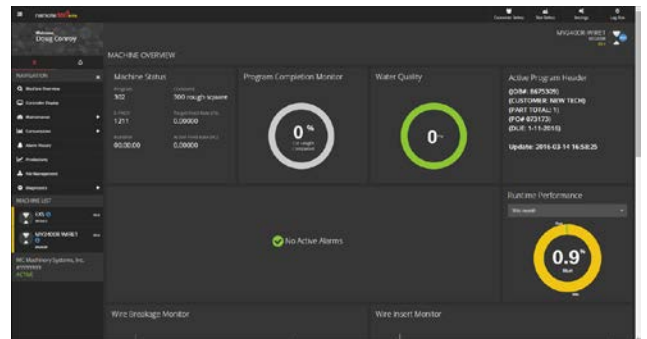
## MITSUBISHI M800 SERIES PC CNC CONTROL CONTINUED

### Billable Cutting Hours are increased reducing non-cutting machine hours

- Calculates all machining time (rough and skim cuts) allowing better job planning and scheduling of deliveries. Records machine performance vs. calculated machining time.
- The M800 control now provides E-manuals, Alarm procedures which includes trouble shooting /solutions for the operator and easy system software updating via USB flash drive
- High speed positioning and graphical part plotting increase machine usage efficiency.
- Mitsubishi M800 multi-tasking control allows complete graphic program checking of the next job while the current job is in progress.
- High Accuracy Edge Positioning provides new edge and center pickup modes for the ultimate in workpiece positioning.
- Consumables Management allows the operator to set estimated life cycles for each consumable and then displays the status on the control screen.



1. Remote End User Monitoring (phone, tablet, computer)
2. Remote Diagnostics & Fault Monitoring Service
3. Remote Support Service



## POWER SUPPLY

- **V350 Type V Anti-Electrolysis Power Supply** and DMX-S (Digital Matrix Control Sensor), specifically shape each spark to improve surface finish, reduce vibration and minimize electrode wear. This reduced wear allows up to a 60% reduction in wire consumption.

### V350-V means **HIGH-SPEED.**

✓ \*24 sq."/hr. with .012" brass wire.

✓ \*38 sq."/hr. with .012" Type D wire.

\* Cutting speed tests are done in 2.0" thick, high-quality hardened D2 steel.

Your results may vary according to your material and test conditions.

- **AE II Processing**, full anti-electrolysis protection from the rough cut through the finish skim cuts reduces the loss of hardness on the machined surface as well as the invisible cracking throughout the part surface.

- **The AE II Power Supply ...**

- \* Helps eliminate electrolytic deterioration and corrosion.
- \* Increases carbide punch/die life by reducing the depletion of the cobalt binder.
- \* Reduces polishing required in molds to remove the effects of electrolytic corrosion created with standard EDM processing.
- \* Helps prevent iron-based materials from rusting.
- \* Helps prevent titanium and aluminum alloys from oxidizing.
- \* Increases DI resin life up to 300%.

- **SL Control** is a newly developed finish control system that greatly reduces lines or fine steps in varying thicknesses of workpieces while improving part straightness. SL also improves the outside sharp corner accuracy to one third that of previous models.

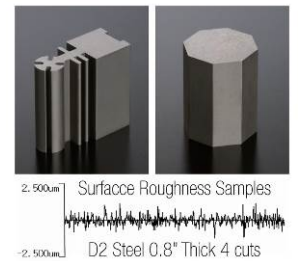
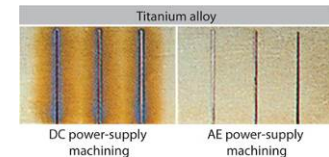
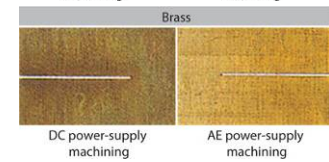
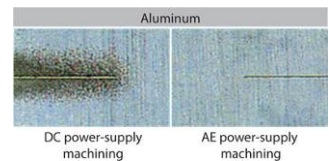
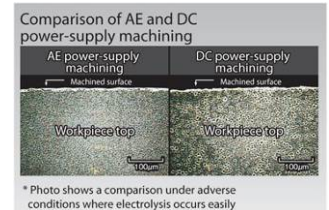
- **MP Circuit** is a newly developed, fine-pulse control technology that allows more precise discharge energy resulting in shorter machining times, particularly with fine wire sizes.

- **RL Circuit** is a high voltage, high off time, fine pulse control technology that allows more precise discharge energy and improves machining of low conductivity materials such as PCD, CBN and Graphite.

- **HL Circuit** is designed to be used when part straightness is of absolute priority.

- **Adaptive Control** protects against wire breaks, accuracy losses, and finish disruptions.

- **PI Circuit** uses a voltage modulation type power source for edge pick-up or wire squaring with no damage to the workpiece, wet or dry.



## **POWER SUPPLY GENERAL SPECIFICATIONS**

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Power Requirement .....3 phase 200~230 VAC  
 60 Hz 13.5 KVA (Higher Voltage Requires a  
 Transformer)

Maximum Output Current ..... 50 Amps

Power Supply Circuit System ..... Transistorized Pulse Circuit

Compressed Air Requirements .....71~100 PSI with 2.7cu.ft./min.  
 Required 3 phase service size:

<u>VAC</u>	<u>AMPS</u>
220	60
240	50
440	30
480	30



## **MV1200-S WIRE CUT EDM SPECIFICATIONS**

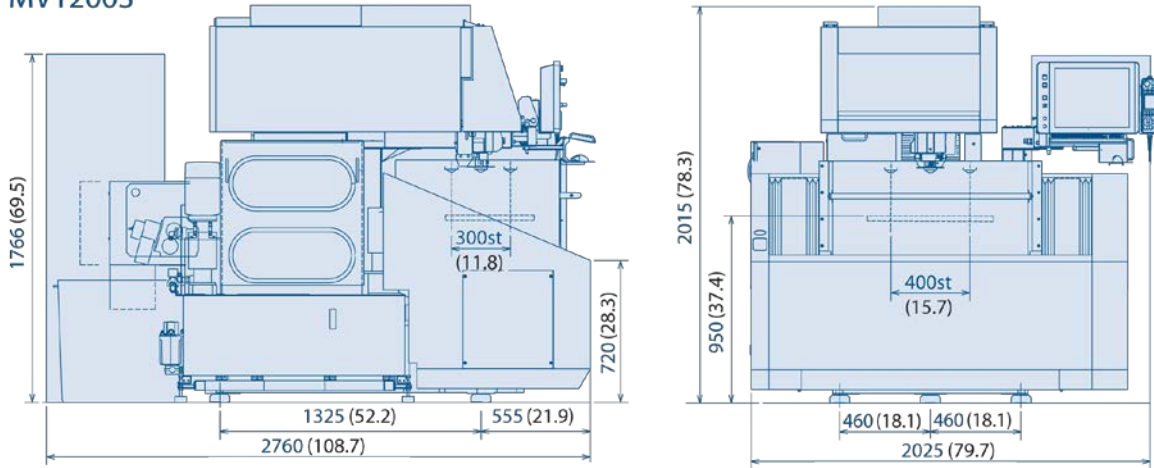
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Max. workpiece dimensions (in) .....	31.9 x 27.6 x 8.5
Workpiece weight (lbs) .....	1,100
Table dimensions (in) (3-sided) .....	25.2 x 17.7
Machining range (in) .....	15.7 x 11.8 x 8.7
U/V travel (in) .....	±2.4 x ±2.4
Resolution (in) (Absolute Scales) .....	.000002 (2 Millionths)
Taper angle .....	15° @ 8.0"
Table rapid feed (in / min) .....	51.2
Wire diameter (in) .....	.004-.012 (.010 Std)
Minimum wire thread start hole (in) .....	.020
Maximum workpiece AT height (in) .....	8.7
Wire tension (g) .....	50 ~ 2500
Wire spooling speed (in / sec) .....	0 ~ 11.8
Filter system .....	Paper cartridge (2x)
Filter Precision .....	5 micron
Ion-Exchange Resin .....	1 ft <sup>3</sup> . (6.4 gal dry)
Filter tank capacity (gallons) .....	145
Dielectric system dimensions (in) .....	Included in machine dimensions
Dielectric system weight (lbs) .....	Included in machine weight
Overall Machine unit dimensions (in) .....	79.7 x 106.4 x 79.3
Machine weight (lbs) .....	5,952

## MV1200-S LAYOUT / TABLE DRAWINGS

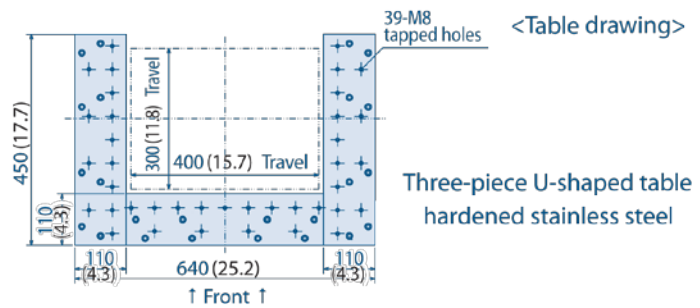
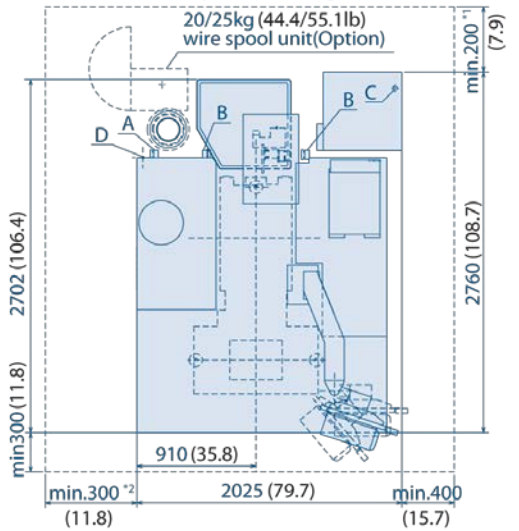
MV1200S

<Outline drawing>



<Layout drawing>

(unit:mm(in))

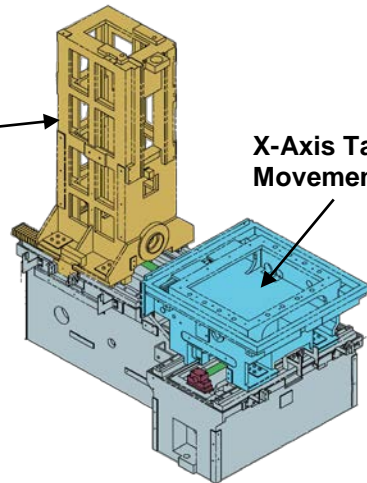


\*1 is min.500 (19.7) and \*2 is min.700 (27.6) when the 20/25kg (44.1/55.1b) wire spool unit is mounted.  
Machine unit dimensions  
Width:1910mm (75.2) Height:2015mm (79.3)

A: Clean tank drain port	Fitted with PT1 screw valve (165 (6.5) from floor)
B: Dirty tank drain port	Fitted with PT1 screw valve (165 (6.5) from floor)
C: Power supply port	200/220VAC±10% 50/60Hz, 13.5kVA
D: Primary air side	0.5 to 0.7 MPa (70 to 100 psi) 75 ℓ (2.6cu.ft.) /min or more, 1/4 hose connection

Y-Axis Column Movement

X-Axis Table Movement



Fill water should be from a DI or RO source to reduce the startup load of the DI System.