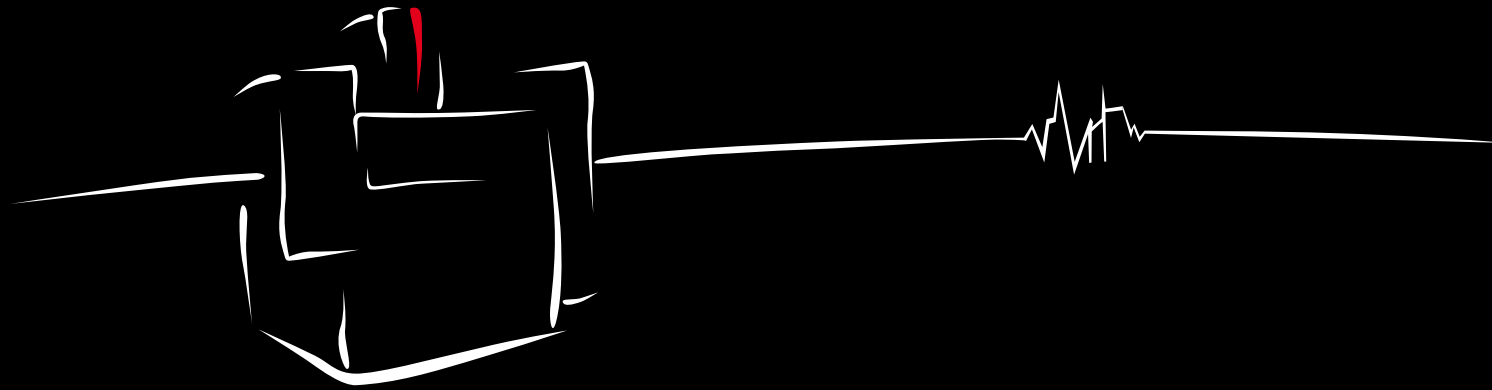


The Art of *Economy*



Die Sinking - Power for Precision

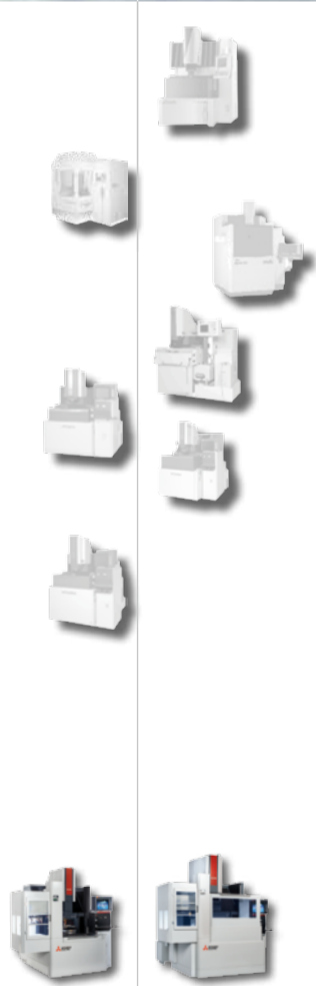


EA-V ADVANCE



33 model series since 1964.

An assurance of dependability.



Mitsubishi Electric	5	Remote control	23
Excellently equipped	7	Consumables	25
Highlights	9	Extras inclusive	27
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Simple adjustments	19	Key data	41
Intelligent user guidance	21	Technical data	43

Over

8,000

patent applications
per year

64,000

produced
EDM machines

129,000

employees

95 years

of dependable
technology



If you've got grand designs,
you need someone strong you can count on.



Since 1970, a growing number of European companies have therefore been turning to high-performance EDM machines from world market leader Mitsubishi Electric.

Only by producing components in-house is it possible to tailor them perfectly to the intended task. Mitsubishi Electric resorts to its own controls, semiconductors, motors and other items, which are adapted in detail to all requirements. The only thing you notice is that it works – and often for many decades after purchase.

If you want to invest soundly in a durable EDM machine, choose **Mitsubishi Electric**.



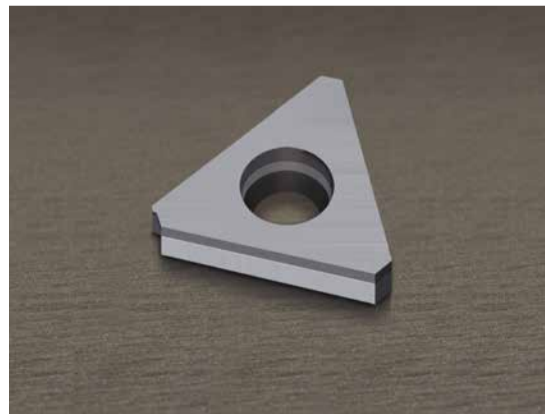
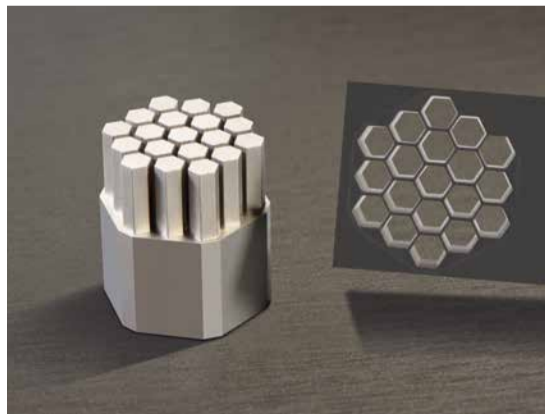
EA-V ADVANCE

This way I know I'm in good hands.



Master of materials – perfectly equipped for any application.

With the EA-V Series, precision comes ready-installed: with glass scales on the X-, Y- and Z-axes and with temperature compensation, the effect of room temperature variations is measurably minimised. Cemented carbide, PCD and titanium are all welcome – the EA-V provides options for almost any challenge.



In-built “spot-on” factor.

If you demand maximum precision, you need a system with in-built temperature compensation to reduce the influence of room temperature changes. The EA-V comes with glass scales on all axes and a closed loop system to ensure maximum precision in practice.

Continued on page 11

Integrated job scheduling.

Greater flexibility thanks to adaptable job scheduling: with the simple assignment of priorities, you can quickly respond to changing requirements and squeeze in an urgently needed part with ease. An excellent first step towards automation, already in-built.

Continued on page 19

3D simulation and optimisation.

Best-possible technology creation for extra precision and speed due to the adoption of 2D or 3D data. Simulation is an assurance of process security and rules out the surprises that you can best do without.

Continued on page 15

Less polishing, more effective cutting.

The Nano Pulse (nP) Circuit lets you shine from the outset. It pays off – not only by reducing your workload, but also by achieving maximum precision straight from the EA-V.

Continued on page 17

PCD/CBN Expansion Unit.

Getting the best out of your diamond tools – with this generator extension, the EA-V Series masters the materials.

Continued on page 29

Flush away eroded particles.

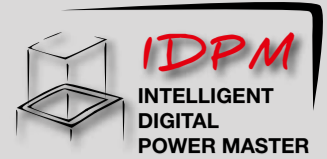
Cut with greater speed and precision thanks to the programmable multiple flushing that removes eroded particles from the kerf.

Continued on page 29

High-speed C-axis.

Reliably producing rotationally symmetrical electrodes and the tiniest diameters.

Continued on page 29



Much less electrode wear achievable at faster cutting speeds.

The Power Master of die sinking. The generator settings are attuned to minimal wear coupled with maximal machining speed in the ongoing process.

Continued on page 13



40% faster process.

Up to 40% faster thanks to optimised axis motions especially for deep cavities. Swift lifting and lowering creates a flushing effect even in deep rib geometries. Everything for optimal results in difficult erosion situations – even in 3D.



Operation must be simple and assist the user.

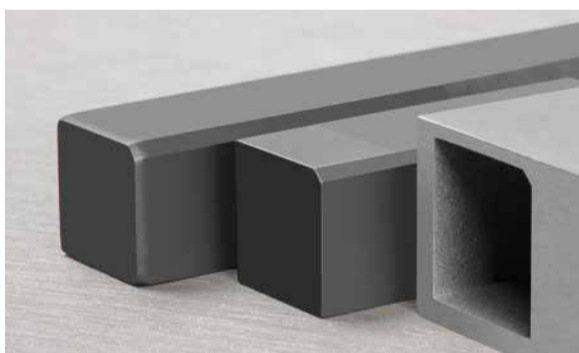
Dialogue-supported programming guides each user intuitively to the desired goal. Experts also readily resort to column programming for quick and flexible adjustments. How to reach your goal.

Continued on page 15

Key features of the EA Series.

Up to 80% less graphite electrode wear

Solid, compact and with sufficient performance reserves when it matters – yet 20% more economical. The EA28V Advance comes with the further-developed FP120V high-performance generator, graphite technology and the new Power Master IDPM. High performance ex-works.



Minimal wear thanks to new graphite technology

The equipment giant among die-sinking erosion systems

An unbeatable price/performance ratio inclusive of electrode changer, automatic fire-extinguishing system and C-axis. This means you're equipped for all eventualities and enjoy maximum versatility plus impressive flexibility.



Replaceable chuck



Set-up the easy way.

The three-sided elevating work tank clears the way – for easy access and simple loading. Graphic user guidance makes workpiece and electrode set-up child's play. Convenience that makes a difference.

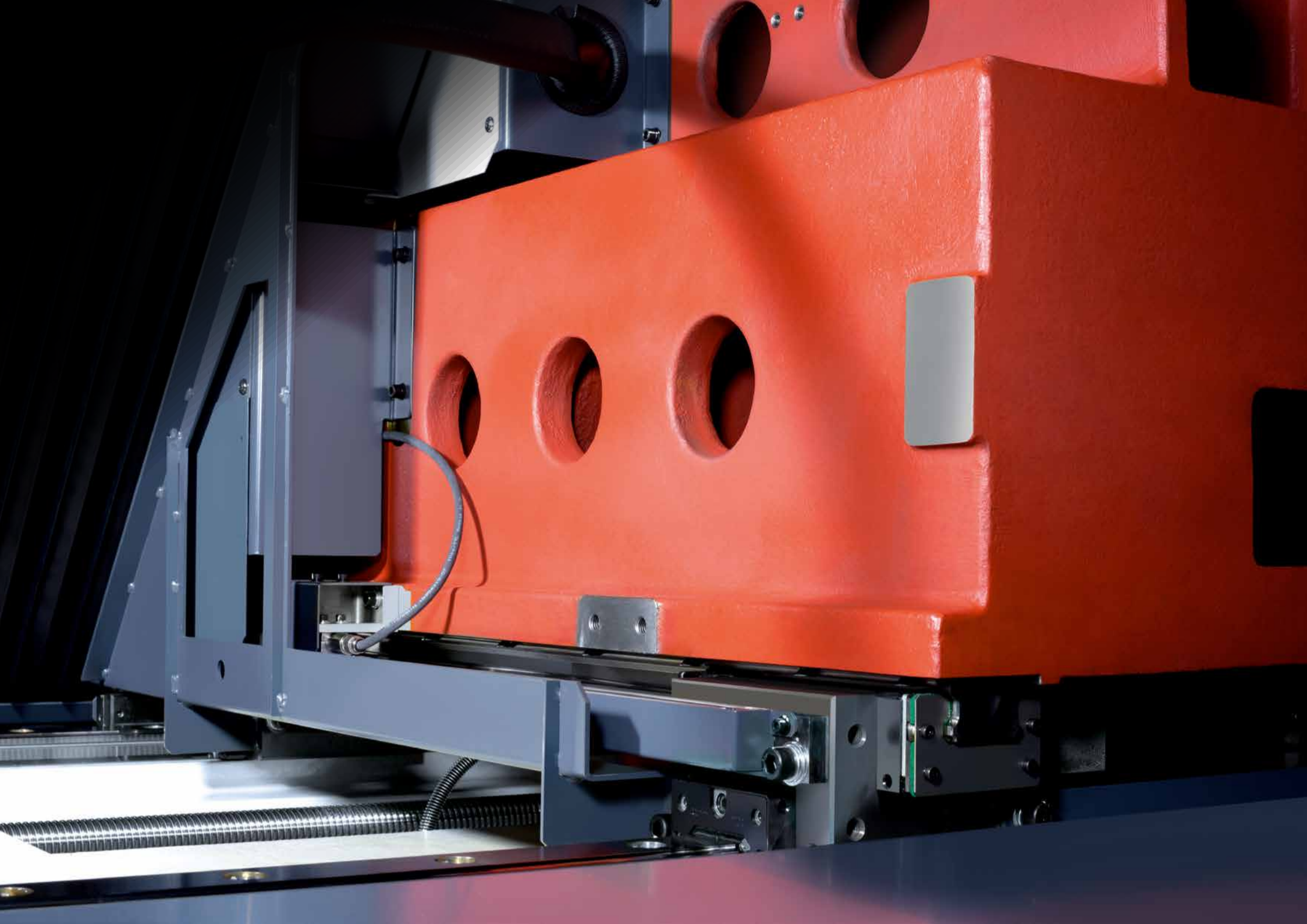
Continued on page 21



An EDM system must help your company to make money.

The EA-V Series cuts expenditure on electricity and filters considerably – so that you can earn more. The machine is designed for decades and has extra-low maintenance needs thanks to intelligent technologies.

Continued on page 25

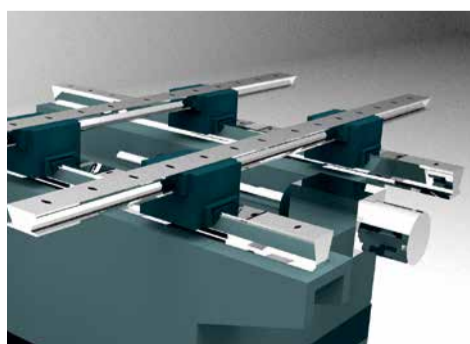


The basis: solid cast steel.

The outcome: compact, solid and ergonomic.

Precise axis motions – whatever the loading

Thoroughly solid mechanical engineering, just the way it should be. Ingenious, tidy and absolutely durable. These principles have decades of success behind them and are cast in metal in each new machine. Inclusive of the use of high-grade axis components.



In-built “spot-on” factor

With the EA-V Series, precision comes ready-installed: with glass scales on the X-, Y- and Z-axes and with temperature compensation, the effect of room temperature variations is measurably minimised.



Ergonomic work space

Good accessibility due to the elevating work tank for convenient and swift set-up. The precision-ground work table at an ergonomic height is equipped with standard T grooves.



Compact and maintenance-friendly

The machine's compact and ingenious layout saves you space and time. Everything under control without long distances. Convenience that you will appreciate long-term.





Now watch:
www.mitsubishi-edm.de/fp80

The generator.

Built for precision, with power in reserve.



The FPV generator is designed for a broad range of applications. Be it the machining of steel with copper or graphite electrodes or the machining of cemented carbide components – the generator technology is a match for any task. The 120A generator is standard on the EA28V Series and optional on the EA12V Series.

IDPM – the key to success

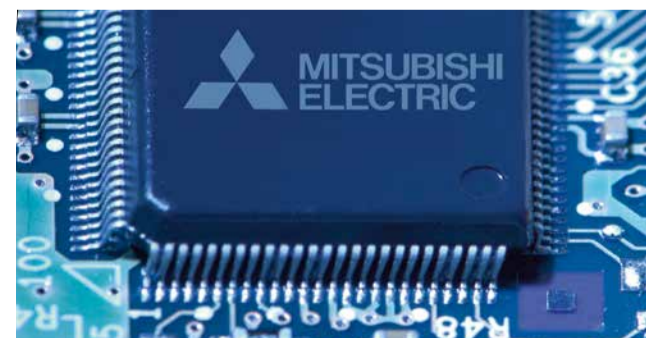
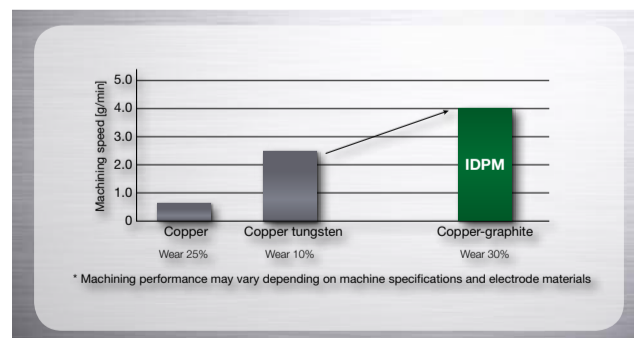
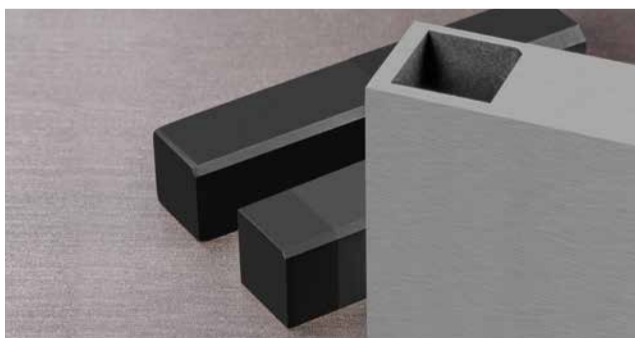
The Intelligent Digital Power Master (IDPM) is the key to the special performance attributes of the EA-V. Minimal graphite electrode wear with high erosion rates and high performance in the machining of cemented carbide – all courtesy of IPDM.

40% higher speed

Significant improvement over conventional machines: up to 40% higher machining speed is achievable with cemented carbide – thanks to the new IPDM. The erosion of cemented carbide is now more cost-effective than ever. An advantage that you will come to appreciate more and more.

Designed for performance

Only if you can produce the crucial electronic components yourself can you design them precisely to requirements. Mitsubishi Electric produces its own semiconductors and adapts them perfectly to the particular application – an obvious benefit for you, the user.





Simple touchscreen operation – like on a smartphone.

Sophisticated technology, simple operation – that’s die sinking today.



Dialogue-guided programming

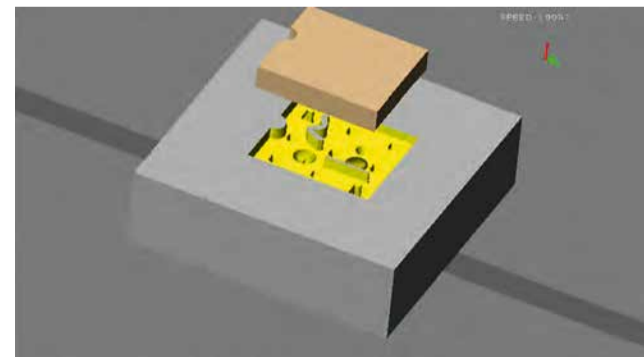
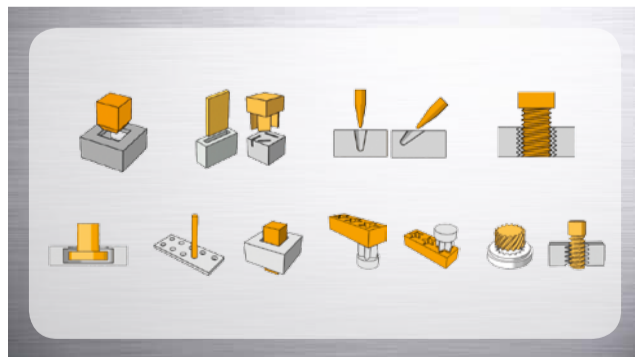
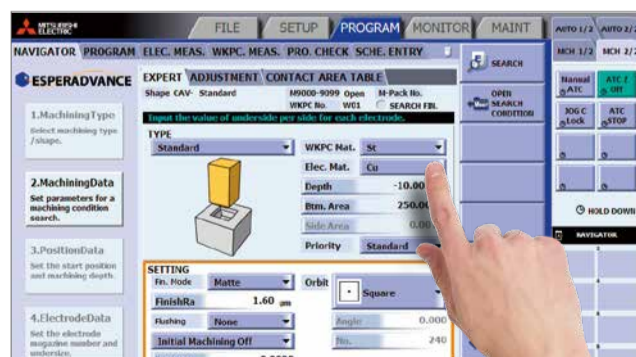
Machining programs are produced entirely with the aid of dialogue guidance – at Mitsubishi Electric by the name of “ESPERADVANCE Navigator”. Plain-language selection windows guide the user from set-up via technology selection through to program start. Something that all users, from beginners to the advanced, will value.

Machining strategy easily produced

Ready for any task thanks to the comprehensive library in the control. Only the details of the task in question are still required, and from this the control automatically generates a complete machining program. From the chosen pair of materials for electrode and workpiece, the technology is automatically selected. Taking you quickly to your goal – for higher productivity and profits.

Even better results with 3D

Import 3D data in the Parasolid® format, select the best-suited technology, use this to generate NC programs with the appropriate machining parameters and control the resultant ESPER machining programs optically. Achieve even more precise results by using Power Master 3D which thinks ahead by intelligently analysing the machining conditions. Simulation is an assurance of process security.



Parasolid is a registered trade mark of UGS PLM Solutions Co., Ltd.



Technical Partner of Sauber F1 Team

The generator that leads the field – nanoprecision not only in cemented carbide.



Response time is decisive

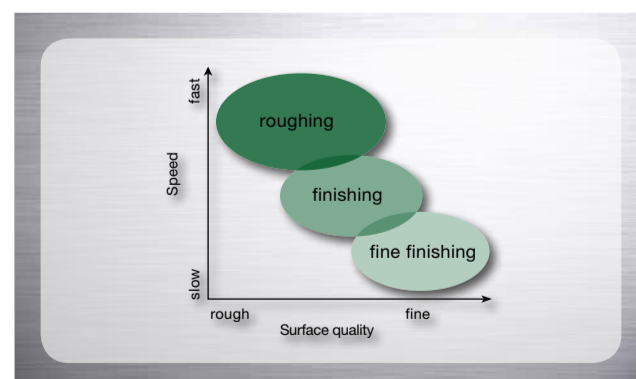
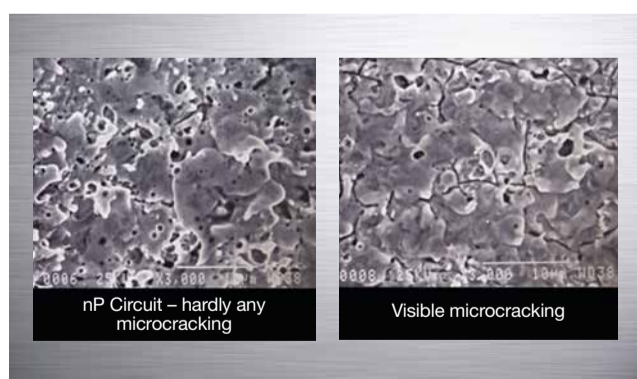
The lower the energy input, the better and more stable the cut edges. Microcracking in the material is minimised into the bargain. The reduced damage to the peripheral zones and better structural integrity yield markedly extended service life, not only as far as stamping tools are concerned.

Extremely low risk of microcracking

What makes the nP Circuit of the EA-V Series special is its gentle application of energy to the workpiece. Extended tool life for cutting punches and other similarly stressed components is an inevitable consequence.

The nP Circuit

The various units of the generator have been perfectly matched, making it possible to achieve a good erosion rate combined with a superlative surface finish.



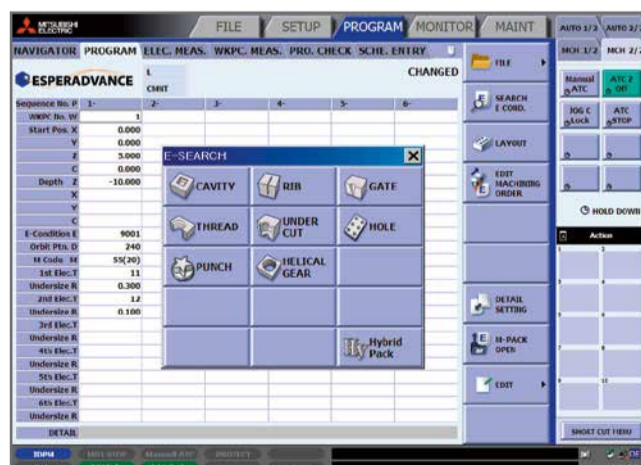


Everything under control – getting there faster with intelligent helpers.



Column programming

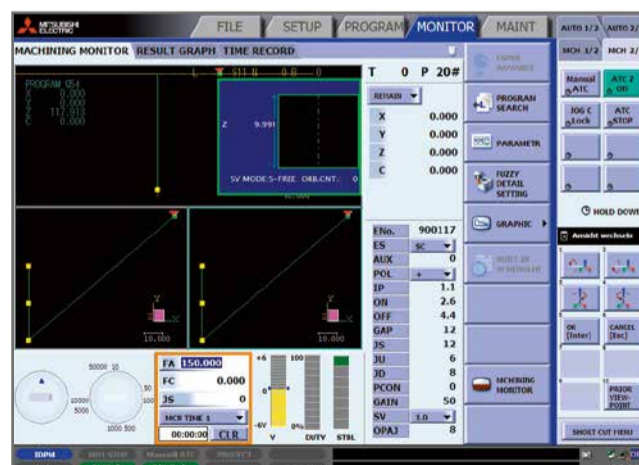
After selection of the technology, all the key parameters are always available at a glance. Neatly laid out and easy to modify – even without menus. Programming multiple machinings or the multiple use of multiple electrodes is always a simple task.



Everything at a glance: direct access to individual settings

Real-time information

Professionals want all the necessary data – the monitor gives them all the relevant information and additionally the chance to intervene in the current process. This way, they have everything comfortably under control throughout and achieve immaculate results every time.

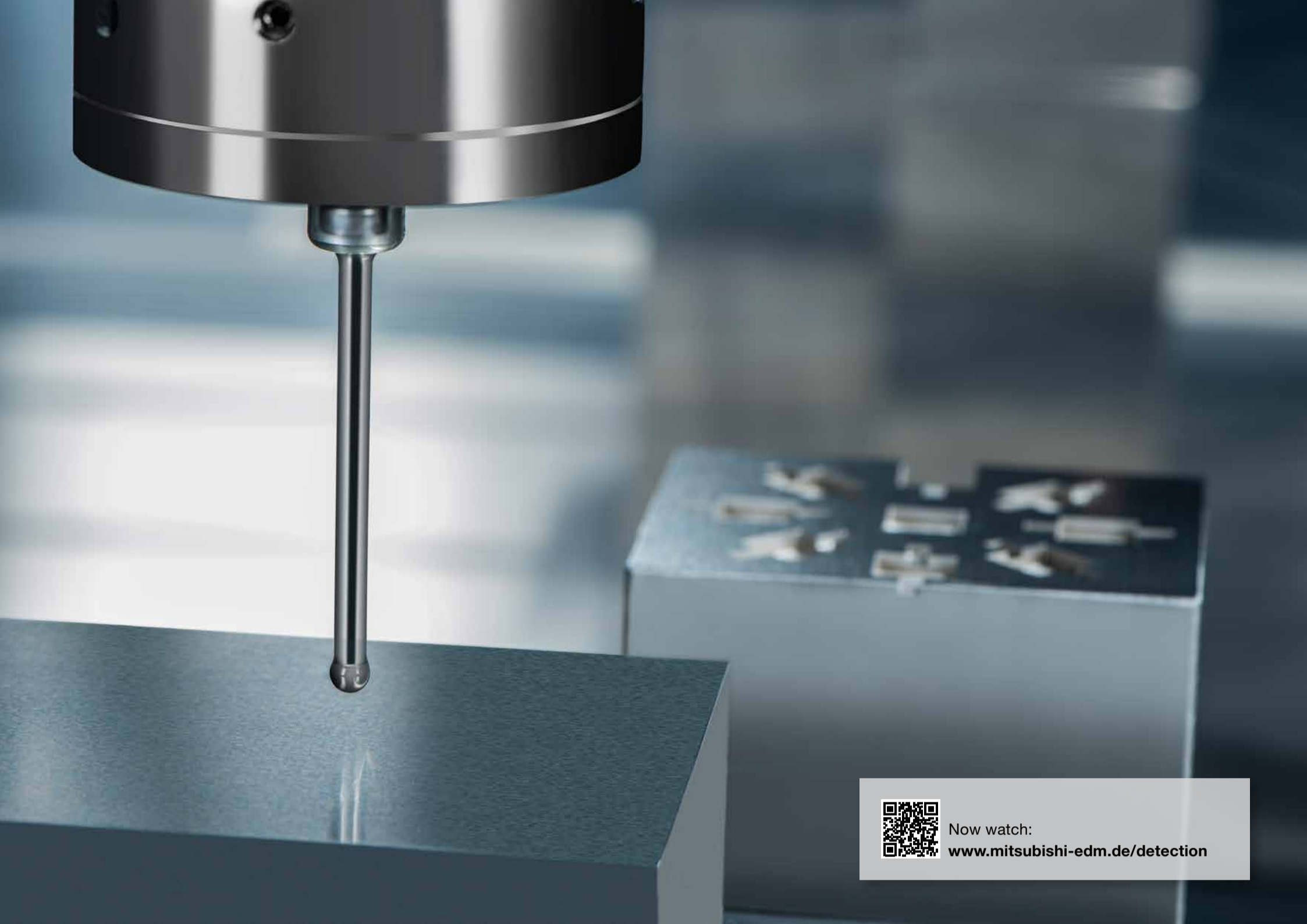


Overview as for the telemetry of the F1

Integrated job scheduling

Greater flexibility thanks to adaptable job scheduling: with the simple assignment of priorities, you can quickly respond to changing requirements and squeeze in an urgently needed part with ease. Several machining programs can be deposited in the job scheduler and managed there.





Now watch:
www.mitsubishi-edm.de/detection

Clamp it and press *Start!*

Set-up the easy way.



Electrode detection

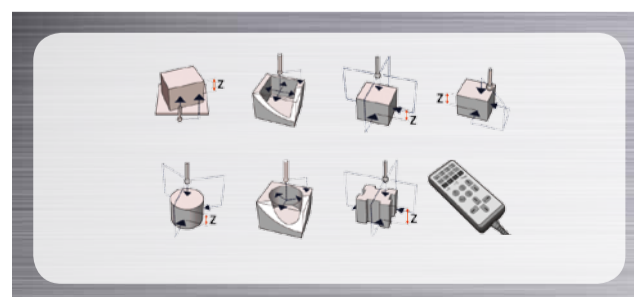
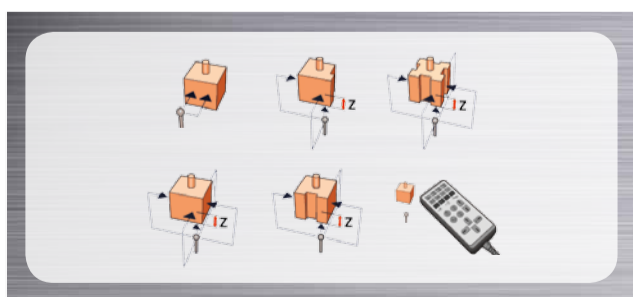
Thanks to automatic and simple electrode position detection, you can work accurately, comfortably and quickly.

Workpiece detection

You can detect the position of the workpieces as comfortably as that of the electrodes.

...or perform external measurement

External presetting on a measuring machine is of course supported by the Mitsubishi Electric EA-V – for automated operation and maximum economy.



Remote control
with mcAnywhere



Always in charge – wherever you are.

You can control the machine and keep an eye on processes, wherever you are. Intelligent communication takes the pressure out of work. Ideal combined with automation solutions and high process autonomy.

mcAnywhere Control

Comfortable and reliable remote control for your EDM system – powered by TeamViewer.

mcAnywhere Service

Rapid help from Mitsubishi Electric experts.

mcAnywhere Contact

Any place, any time...always up to date with direct status messages. Via your PC, mobile phone or smartwatch.





Replacement with the machine running

Quick replacement, long-term savings.



Rapid filter change...

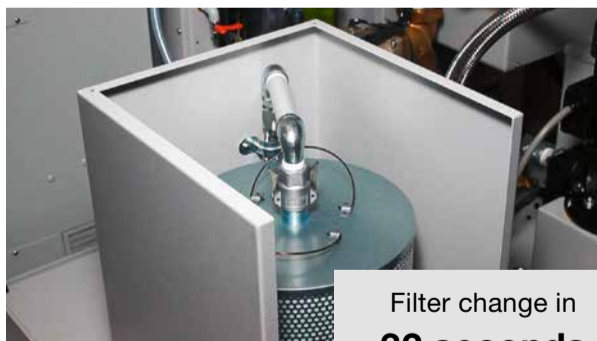
...without tools or wasted time. Two hands, 32 seconds – and the filter is replaced.

Automatic central lubrication

Makes for smooth running long-term – entirely without stoppages, lubrication nipples or cumbersome grease guns. You can now make more productive use of this time.

What makes the EA-V so maintenance-friendly and economical?

The erosion systems from Mitsubishi Electric rank among the most dependable on the market. Thanks to their low maintenance needs and less downtime, you can't help economising – year after year.



Filter change in
32 seconds



Machine lubrication in
0 seconds



Now watch:
www.mitsubishi-edm.de/e-filtering



EA-V ADVANCE

While others are still setting up, you're already cutting.



Ready for operation with extras.

With these you can plan.

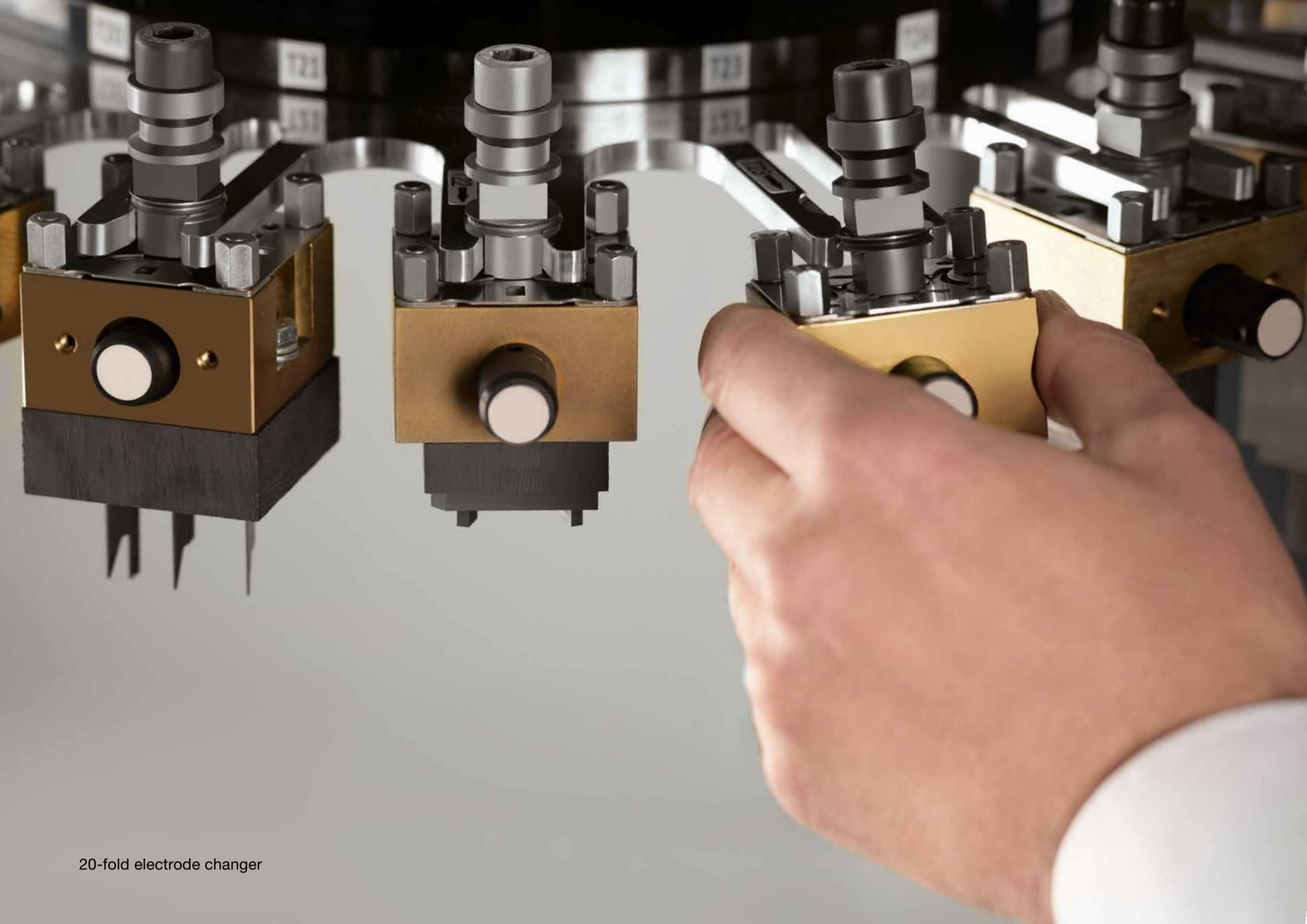
Inbuilt safety

Safety always comes first and therefore has to be integrated in the basic equipment so that you can even run your machine without supervision, if need be. The automatic fire-extinguishing system is supplied as standard.

C-axis inclusive

The freely programmable precision C-axis that operates in simultaneous mode is part of the standard package. The axis can also be employed rotationally and equipped with all the conventional chucks such as EROWA ITS, Hirschmann System 4000, System 3R Macro/Combi (EROWA ITS is standard).

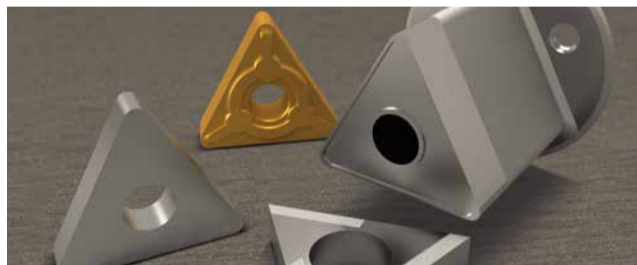




20-fold electrode changer

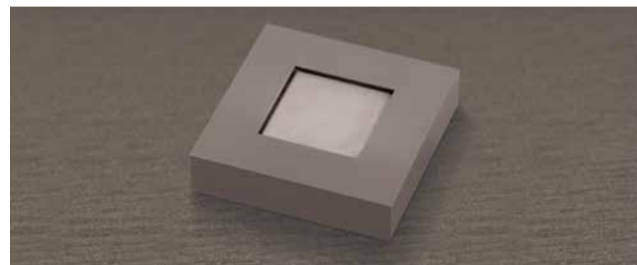
Adapting to your needs – with precision.

PCD/CBN Expansion Unit



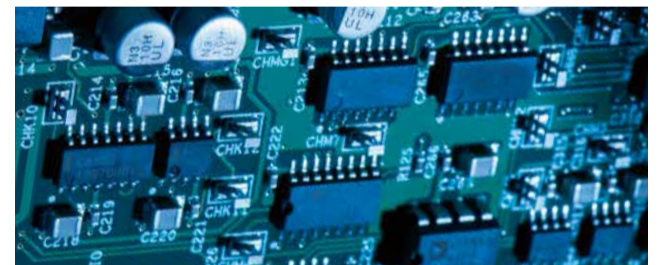
Getting the best out of your diamond tools – with this generator extension, the EA-V Series masters the materials.

nP Circuit



The Nano Pulse Circuit lets you shine from the outset. It pays off – not only by reducing your workload, but also by achieving maximum precision straight from the EA-V.

FP120V generator



On the EA12V the standard generator can be replaced with the more powerful 120A generator of the FP120V type – if high performance is what counts.

High-speed C-axis



Rotation at up to 1500rpm, as a CNC axis simultaneously in operation or for electrode positioning – with this, anything is possible. Always CNC-integrated.

Programmable multiple flushing



Cut with greater speed and precision thanks to the programmable multiple flushing that removes eroded particles from the kerf – for better results.

20-fold electrode changer



Ideally equipped for all eventualities – maximum versatility and impressive flexibility.



Customised extension.

The intelligent solution.

B-axis ITS-HV-100



As an addition to the four standard axes, a further simultaneous axis can be integrated as a B-axis.

Warning lamp



The three-stage LED warning lamp clearly indicates the machine status, making it visible from a distance – and it looks good as well.

ERGO-LUX



Additional ergonomic work space lighting – so everything is clearly visible.

ITS-MS-24 rotary spindle



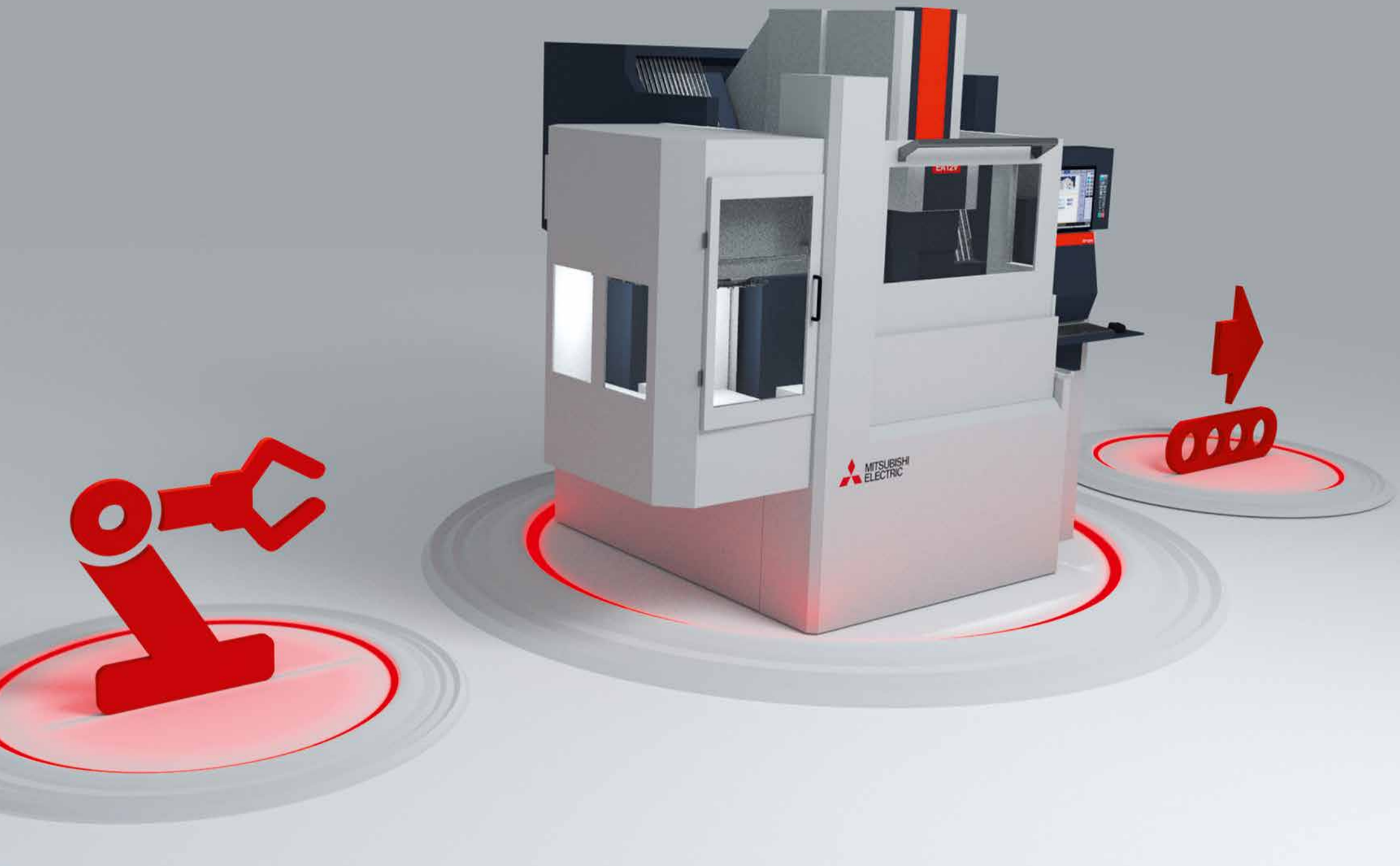
The rotary spindle can be integrated in the machine control – this way it can also function as an infeed axis or even operate in simultaneous mode.

Optional chuck (Hirschmann/System 3R)



Be it from EROWA, System 3R or Hirschmann, the chuck always fits. The standard C-axis interface is completely flexible.

The field of application and range of uses determine the form of automation – everything's possible!



Automation has to be flexible.

Reconciling different brands.

Optimum solutions – customised, configured or standardised

The handling systems and robots from different manufacturers can often be seamlessly integrated. Renowned for their dependability and productivity, the EDM machines of the EA-V Series from Mitsubishi Electric are automation-ready. We'd be happy to show you examples that have proven effective in practice and help you to cut costs and boost your productive capacity. All EA-V models come ex-works with practical job scheduling that permits instantaneous adaptation to current needs.



Handling equipment from different manufacturers – welcome and easily integrated. For multi-machine applications job management software is advisable.



Flexible solution: Articulated-arm robot up to 15 kg of Mitsubishi Electric quality.



One-to-one control straight from the machine.



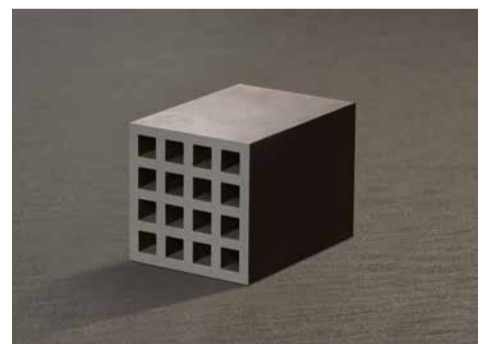
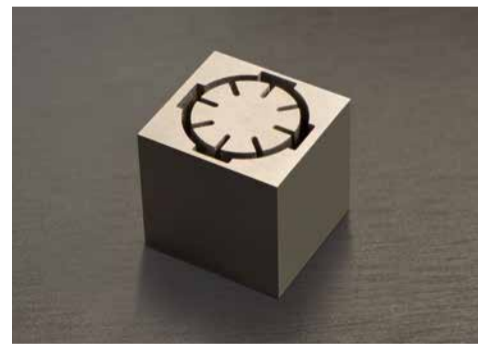
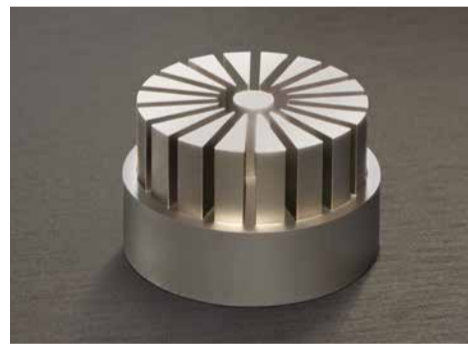
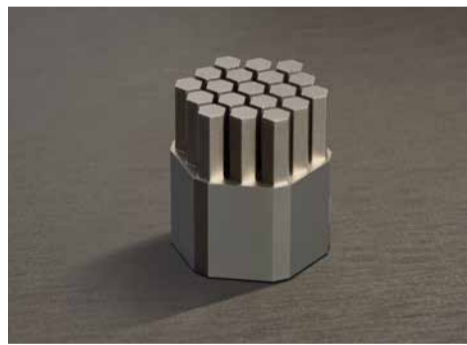
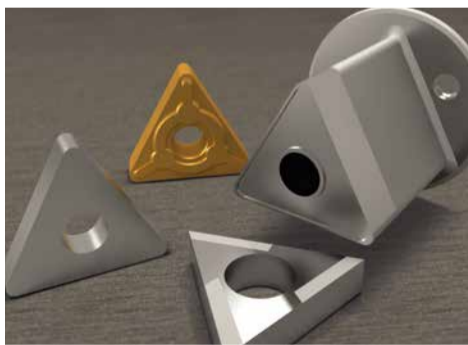
Faster pulse evaluation, more accurate results

The control electronics is much faster than traditional machines. A great basis for immaculate component results – in terms of geometrical trueness and surface roughness.



Built for masterpieces – a new chapter in precision.

Medicine • Vehicle industry • Communications/electrics • Aerospace • Clock industry

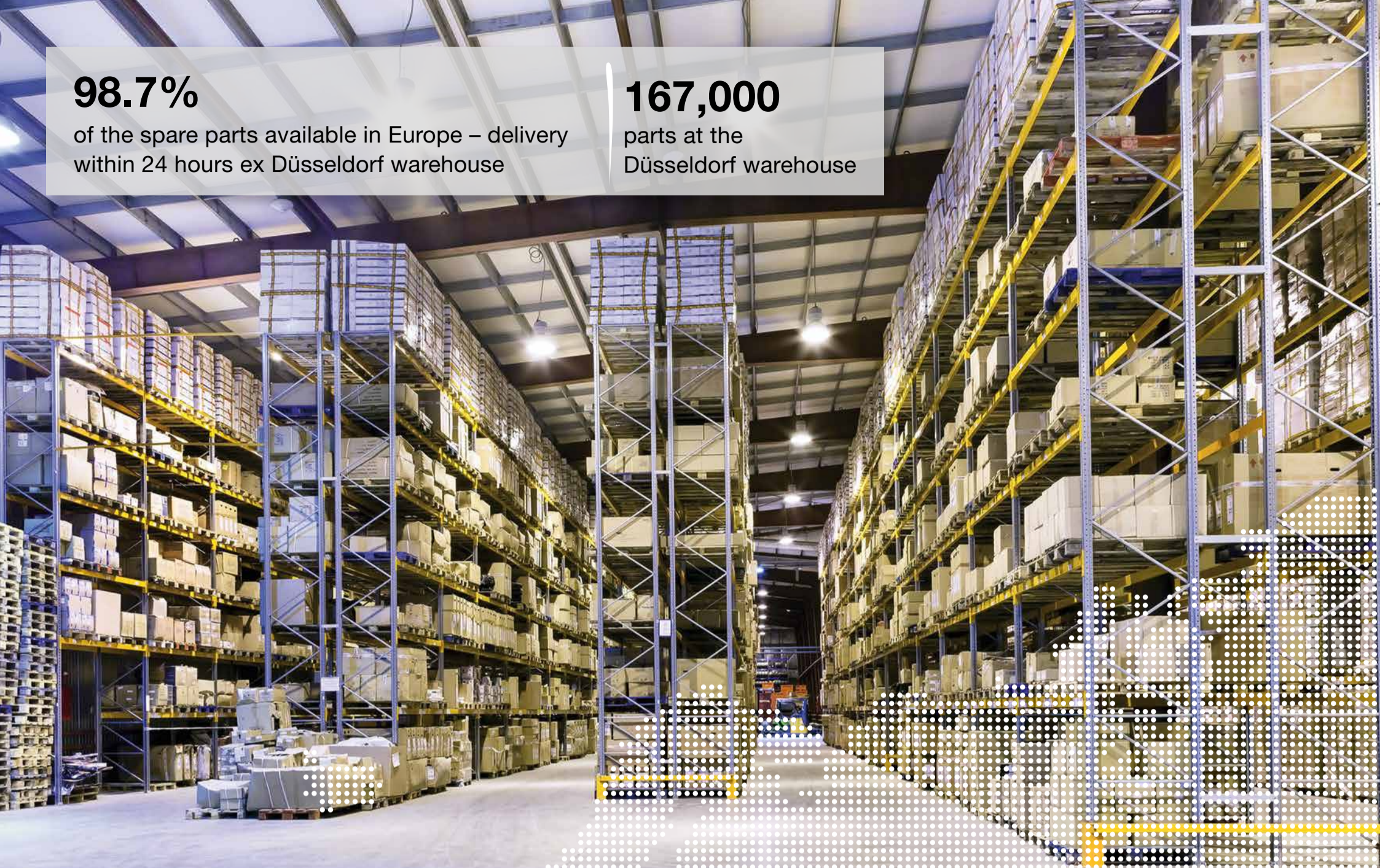


98.7%

of the spare parts available in Europe – delivery within 24 hours ex Düsseldorf warehouse

167,000

parts at the Düsseldorf warehouse



Headquarters in **Ratingen, Germany**

Service.
Always there.

Training

Users acquire skills at the machine and at specially equipped PC workstations. This way they benefit most from the direct transfer of know-how.

You don't like call centres and queuing systems? We don't either. With every Mitsubishi Electric EDM system you buy excellent service as part of the package.

With 167,000 parts in stock in Ratingen near Düsseldorf, you have a swift and reliable source of parts – on request by express in less than 24 hours. Service is performed by our own highly skilled service technicians so that production is kept dependably up and running.

Users are assisted over the phone and benefit from the expertise and wealth of experience of Mitsubishi Electric specialists.

Service hotline: +49 (0) 1801 486-600
Application support: +49 (0) 1801 486-700
Monday to Friday: 7.30 am to 8 pm
Saturday: 9 am to 4 pm

We're there to help you.

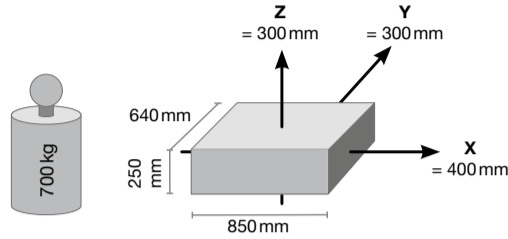
Masters of materials – perfectly equipped for any application.

Cemented carbide, PCD and titanium are all welcome – the EA-V provides options for almost any challenge.

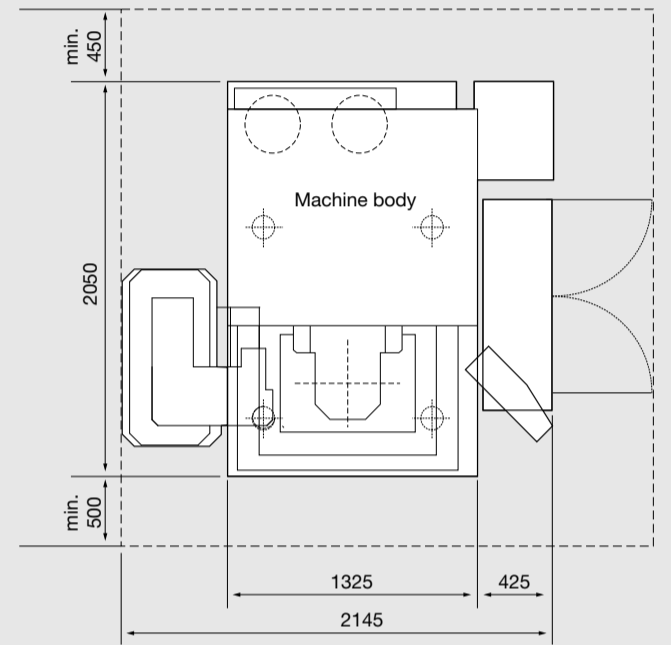
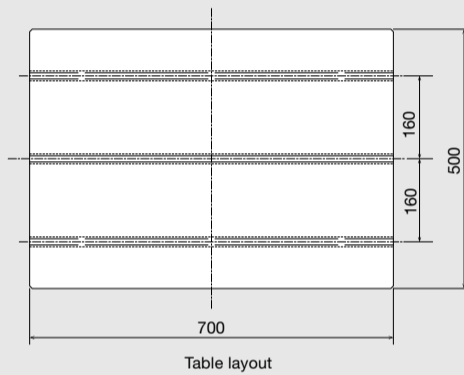
Workpiece	Electrode				
	Copper	Tungsten-copper	Graphite	Copper-infiltrated graphite	Optional: PCD/CBN Expansion Unit
Steel	✓	✓	✓		
Aluminium (alloys)	✓		✓		
Copper (alloys)	✓		✓		
Cemented carbide		✓		✓	
Titanium			✓		
Nickel (alloys)			✓		
Polycrystalline diamond and cubic boron nitride					✓



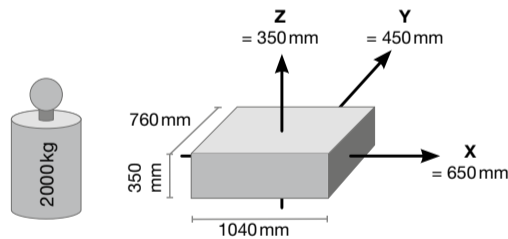
EA12V
ADVANCE



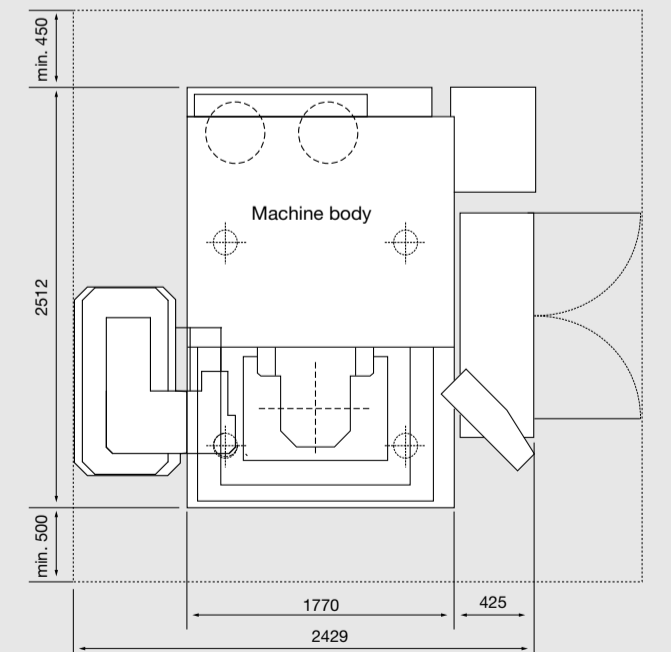
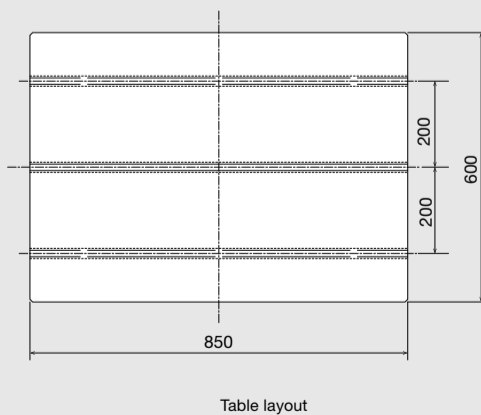
Machine body weight 3725 kg
 Generator weight 260 kg (at 120A: 300kg)
 Machine height 2335 mm
 Required minimum dimensions
 for doorways (W x H) in mm 1910 x 2335



EA28V
ADVANCE



Machine body weight 5400 kg
 Generator weight 300 kg
 Machine height 2615 mm
 Required minimum dimensions
 for doorways (W x H) in mm 2022 x 2615





EA12V Advance

EA28V Advance

Machine		EA12V Advance	EA28V Advance
	Travel (X/Y/Z) in mm	400/300/300	650/450/350
	Max. workpiece dimensions (WxDxH) in mm	850x640x250	1040x760x350
	Max. workpiece weight in kg	700	2000
	Max. electrode weight in kg	50	200
	Table dimensions (WxD) in mm	700x500	850x600
	Table layout	Stainless steel table	
	Daylight (table – C-axis with EROWA chuck) in mm	152.5–452.5	317.5–667.5
	Max. dielectric filling level	300	400
	Overall dimensions with tool changer (WxDxH) in mm	2145x2050x2380	2429x2512x2615
	Machine weight in kg	3725	5400
Mains voltage	3-phase 400V/AC, 50/60Hz		

Filter system		EA12V Advance	EA28V Advance
	Tank capacity in l	400	595
	Filter particle size in µm/Filter elements	3/2	3/3
	Temperature control	Dielectric cooling unit	
	Weight (dry) in kg	Included in machine weight	

Generator		EA12V Advance	EA28V Advance
	Power supply unit	Transistor-controlled pulse generator	
	Cooling method	Totally sealed/indirect air cooling	
	Max. output current in A	80 (optional 120)	120
	Dimensions (WxDxH) in mm	400 x 900 x 1763	
	Weight in kg	260 (at 120A: 300)	300

Control		EA12V Advance	EA28V Advance
	Input method	Keyboard, USB flash drive, Ethernet	
	TFT colour monitor/Control system	15" touchscreen/CNC, closed circuit	
	Min. command step (X/Y/Z/U/V) in µm	0.1	
	Min. axis resolution in µm	0.1	

EA12V Advance

EA28V Advance

Equipment		EA12V Advance	EA28V Advance
	Dual position-measuring system with linear scales (X/Y/Z)	Yes	
	Three-sided elevating work tank	Yes	
	20-fold electrode changer	Optional (not retrofittable)	
	FP120V high-performance generator	Optional (not retrofittable)	Yes
	Ethernet/DNC/FTP	Yes	
	C-axis with EROWA chuck (1–30 rpm)	Yes	
	3R macro chuck	Optional	
	mcAnywhere Control/Contact/Service	Optional	
	External signal output	Optional	
	Tricolour warning lamp	Optional	
	ERGO-LUX	Optional	
	Additional rotary axes	Optional	
	nP Circuit	Optional (not retrofittable)	
	PKD/CBN circuit	Optional (not retrofittable)	
	High-speed spindle (1–1500 rpm)	Optional (not retrofittable)	
	Programmable multiple flushing	Optional (not retrofittable)	

Power connection: 3-phase 400V/AC, PE, ± 10%, 50/60 Hz, primary fuse 32 A slow

Pneumatic connection: 5–7 kgf/cm², 500–700 kpa, minimum air flow rate 60 l/min, 3/8" hose connection

The EDM system should be set up on a suitable hard industrial floor and preferably on a consolidated concrete floor. Any shielding that may be necessary in conformity with the EMC Directive is not included in the equipment supplied by Mitsubishi Electric.

The cooling unit contains fluorinated greenhouse gas R407C. For further information, please refer to the associated operating instructions.



Details can be found in the assembly plan of the machine:
www.mitsubishi-edm.de/download

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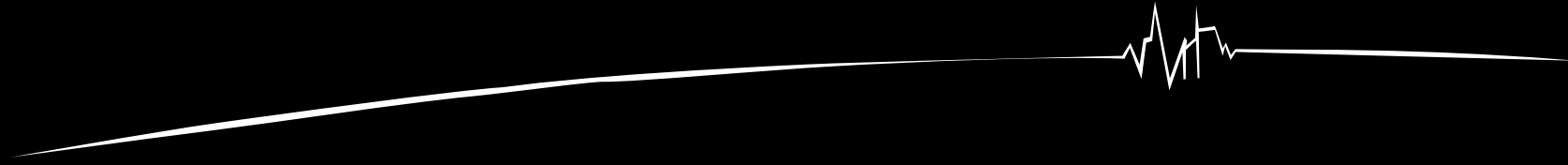
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