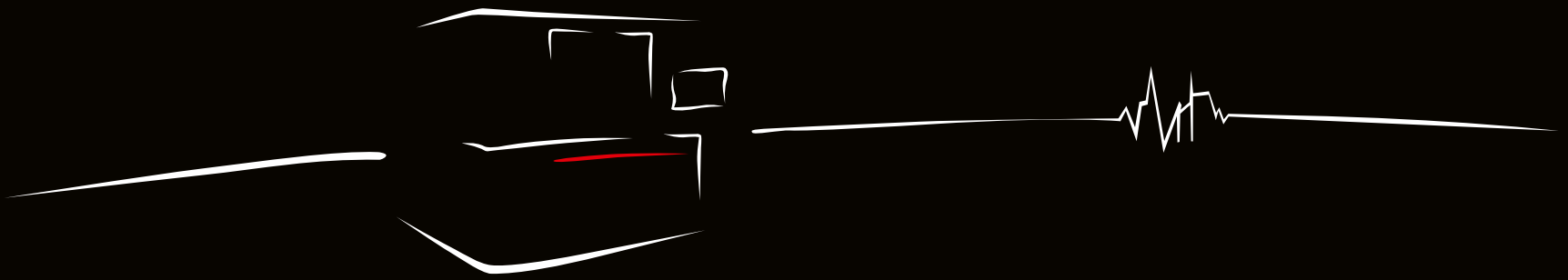
MITSUBISHI ELECTRIC

D-CUBES

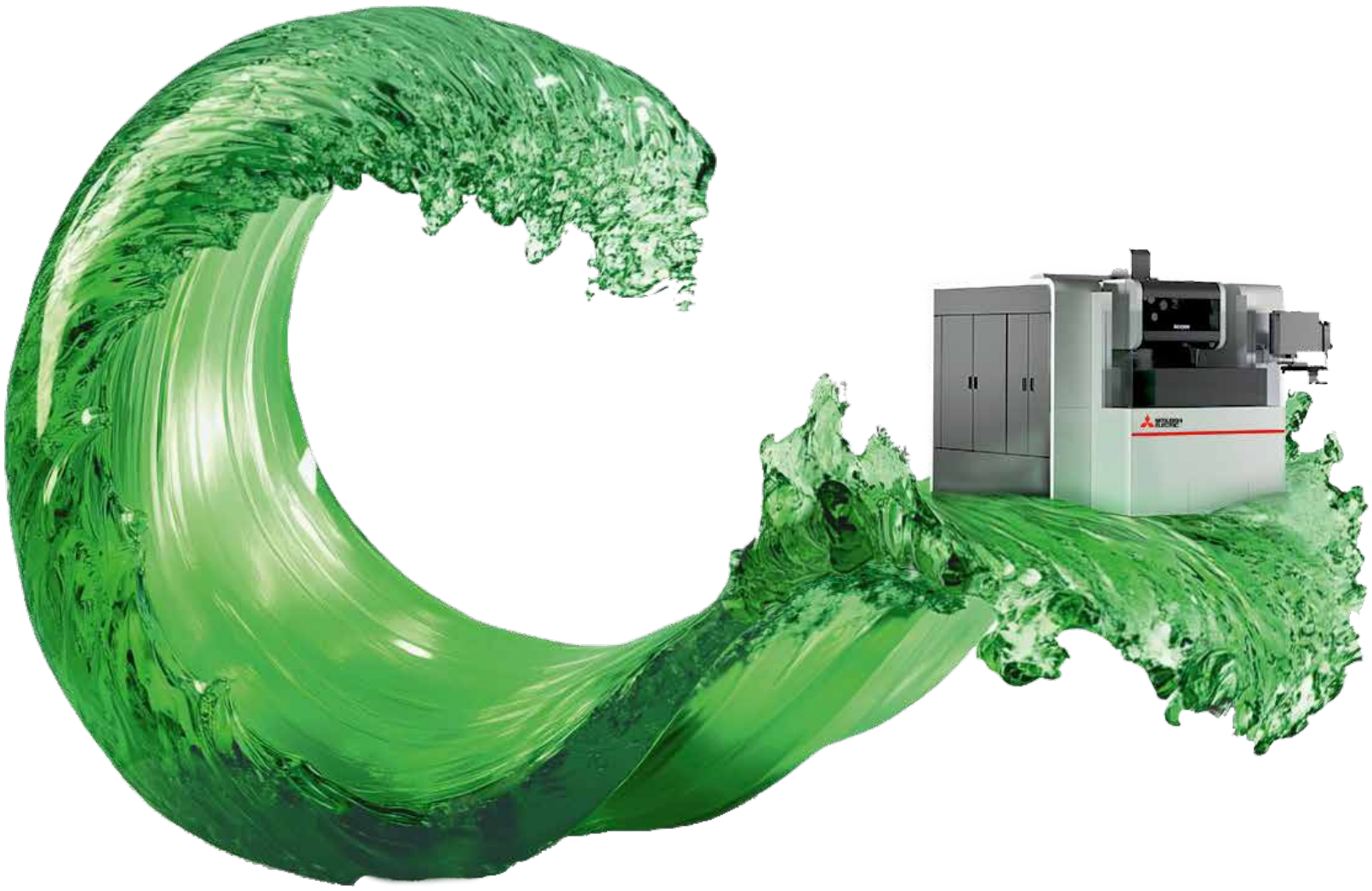
The Art of Economy



Wire-cut EDM

Pure Precision

MX900 SERIES



Surf the Oil Wave

MX900

43 model series since 1964.

An assurance of dependability

Mitsubishi Electric 5
Highlights 7

Functions and Design

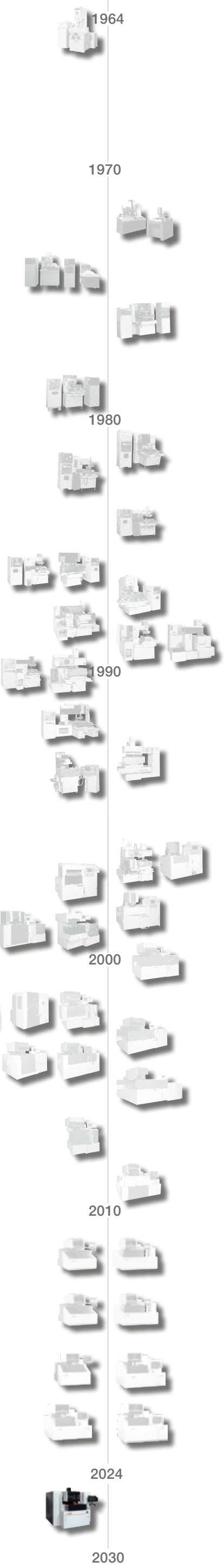
Design 9
Temperature management 11
Tubular Shaft Motor 13
Spot-on precision 15
Wire threading 17
customized process control 19
XEDM - Programmed for You 21
MAISART even more accurate 23
Intelligent user guidance 25
Remote control 27
Nanopulse generator 29

Economy / Capabilities / Services

Consumables 31
Optional extras and non-standard materials 33
Examples of applications 35
Service 37
Training 39

Specifications

Key data 41
Technical data 43

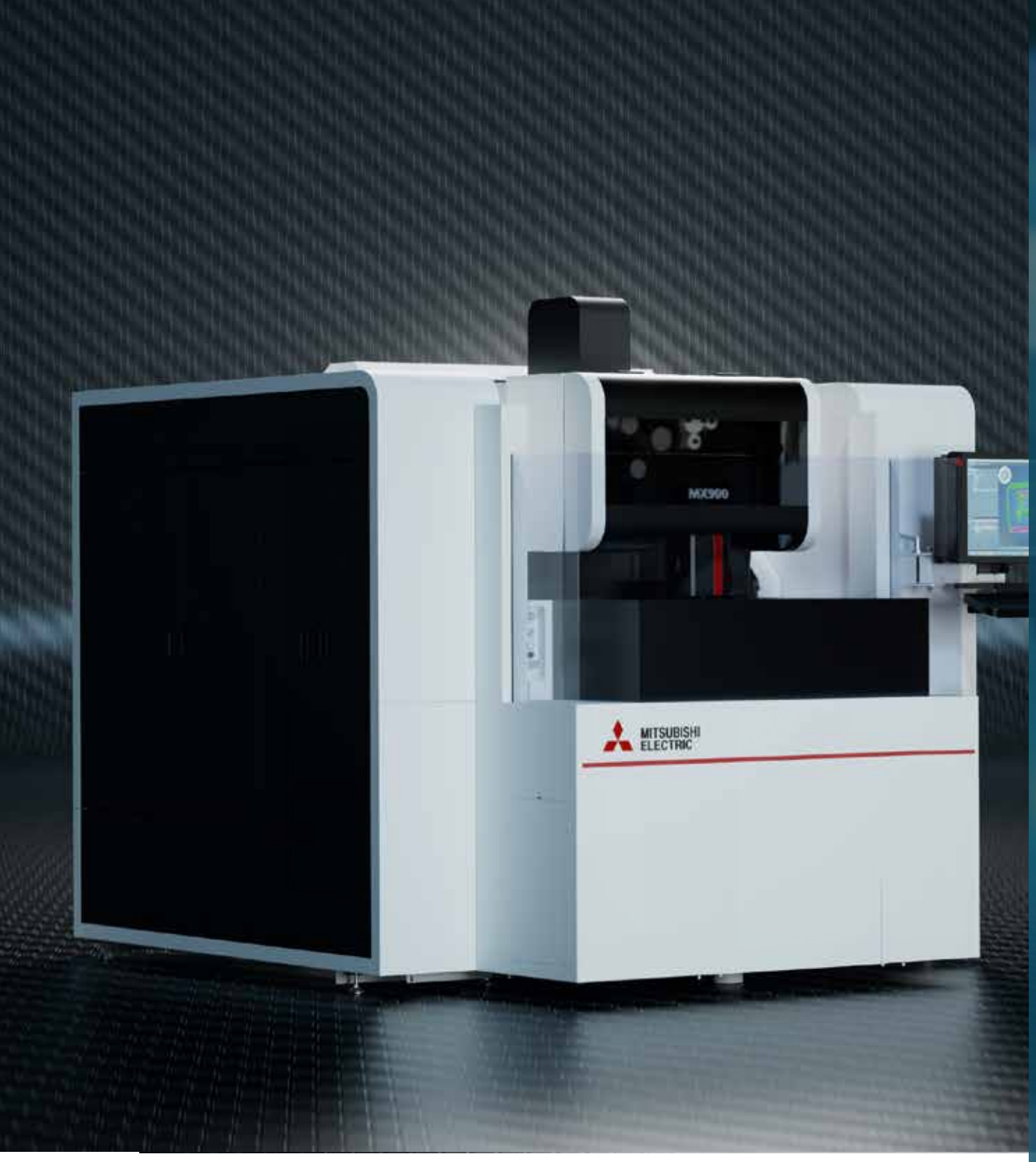


If you've got grand designs,
you need someone strong you can count on.

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.



The button that is programmes for you

XEDM writes the code for you and prevents costly errors. Operating machines has never been so easy and effective.
Continued on page 21

NUI
NATURAL USER INTERFACE

Solid machine construction – decoupled periphery

Good machining results depend on a solid machine construction – made of proven ductile iron. We're going a step further and are decoupling the machine base from all peripheral equipment. In doing so, we're eliminating all vibration and thermal effects on the machine – for the benefit of machining accuracy.
Continued on page 9

RIS
RIGIDITY & ISOLATION STRUCTURE

The speed of light ...

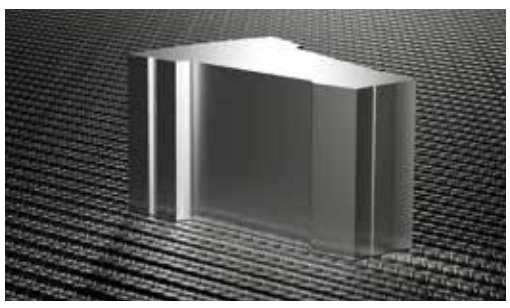
... for communication by fibre optics.
The Tubular Shaft Drive with its highly responsive control fully exploits the benefits of high communication speed. No heat, no maintenance and no contact – just extra precision for good. At Mitsubishi Electric, this is known as "Changes for the Better".
Continued on page 13

ODS
OPTICAL DRIVE SYSTEM

Perfection in oil
that's second to none.

The MX900 marks the dawn of a new era in precision.
Developed for a combination of extreme accuracy and superlative surface quality.


Positional accuracy < ± 1 µm


Surface roughness Ra 0,04 µm


Geometrical accuracy < ± 1 µm


Roundness < 1 µm

Extra precision and speed thanks to the generator that not only thinks, but also thinks ahead.

If you want to achieve better surface quality with fewer skim cuts, you need the right blend of mutually adapted technologies. With Precise Finish Cut, you achieve more precise results faster.
Continued on page 15

PFC
PRECISE FINISH CIRCIUT

The finest sparks...

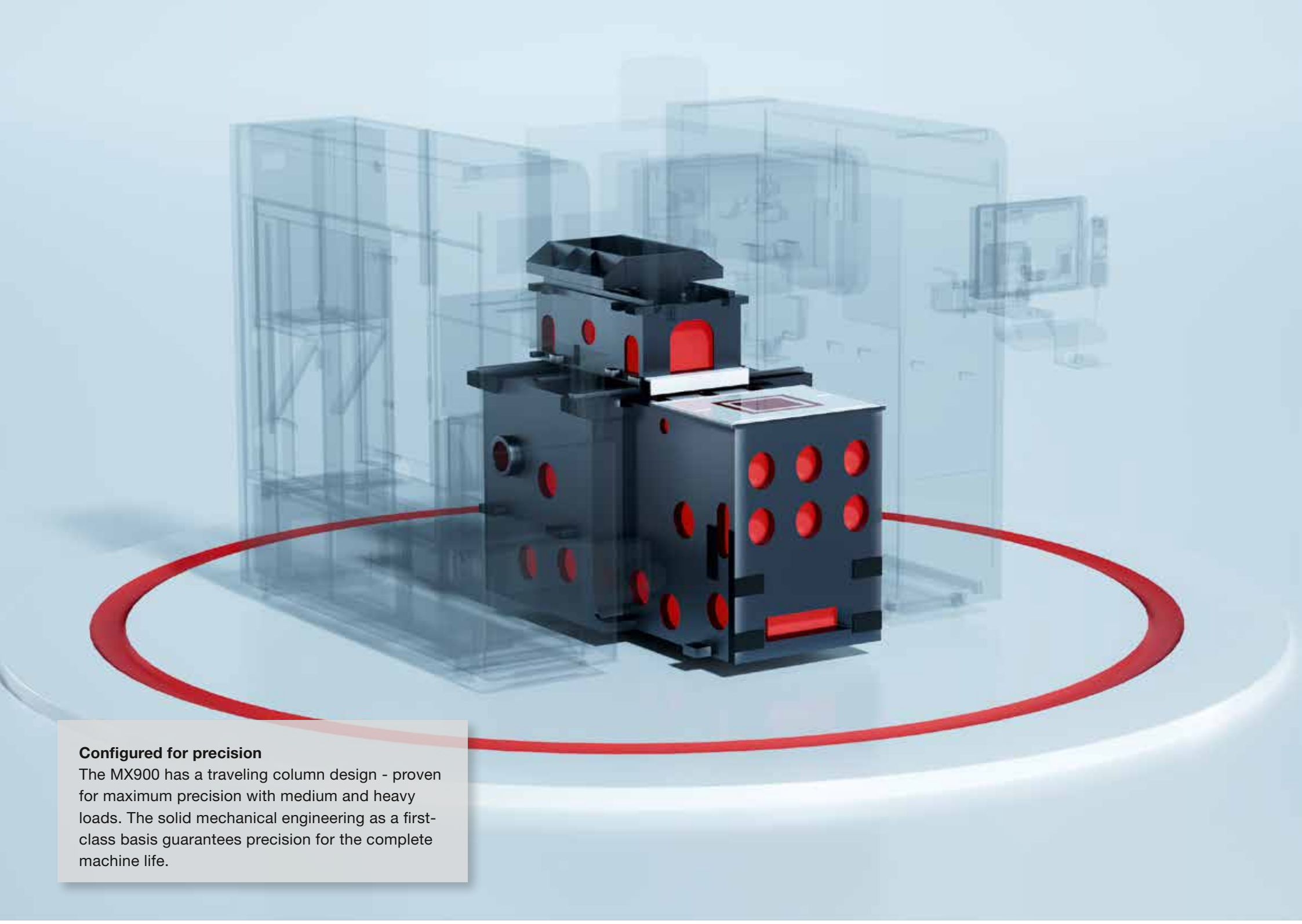
...are essential for superlative wire-cutting results in terms of surface quality and geometrical accuracy. The nanopulse generator is the source of these fine sparks, creating a precisely controlled, uniform spark pattern along the entire cutting path – all in the service of optimal machining in the dielectric oil.
Continued on page 29

nPV
NANO V-POWER SUPPLY

Reliable threading and rethreading – even with the smallest-diameter wire

Reliable and secure threading of 0,05 mm cutting wire in a 0,20 mm start hole – success rate close to 100% and less than 10% at second attempt. See for yourself!
Continued on page 17

AT
INTELLIGENT AUTO THREADING



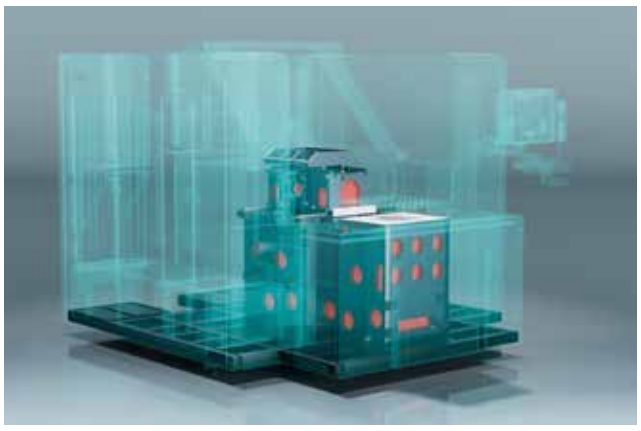
Configured for precision
The MX900 has a traveling column design - proven for maximum precision with medium and heavy loads. The solid mechanical engineering as a first-class basis guarantees precision for the complete machine life.

Ductile iron.

A micrometre removed from the future.

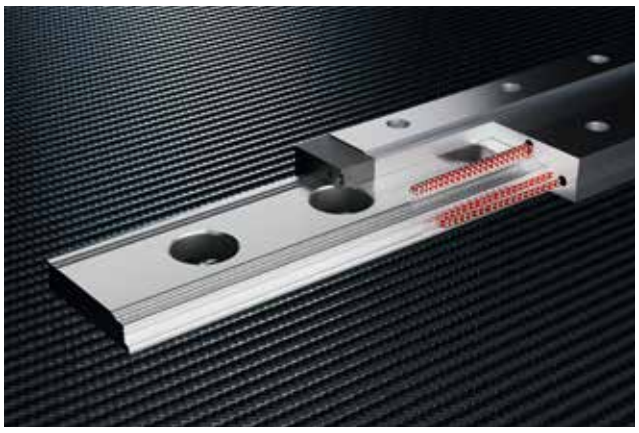
RIS
RIGIDITY & ISOLATION STRUCTURE

Decoupled from „vibration and heat“



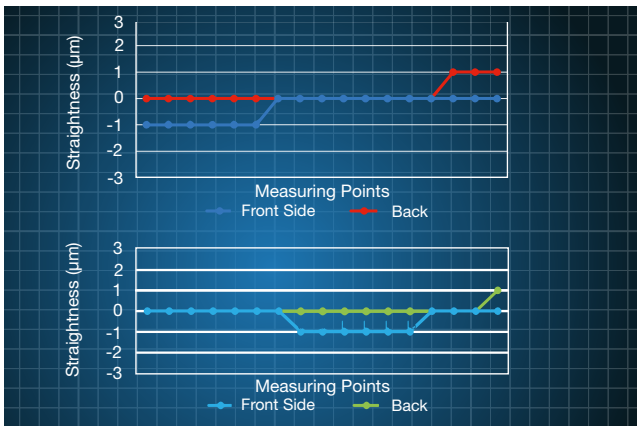
The wire-cutting machine stands within a fully enclosed housing – but on its own machine feet. All additional units are arranged on a surrounding floor slab and are fully decoupled from the machine. This eliminates disturbance caused by vibration and thermal effects on the machine.

100% more balls - more precise axis movements

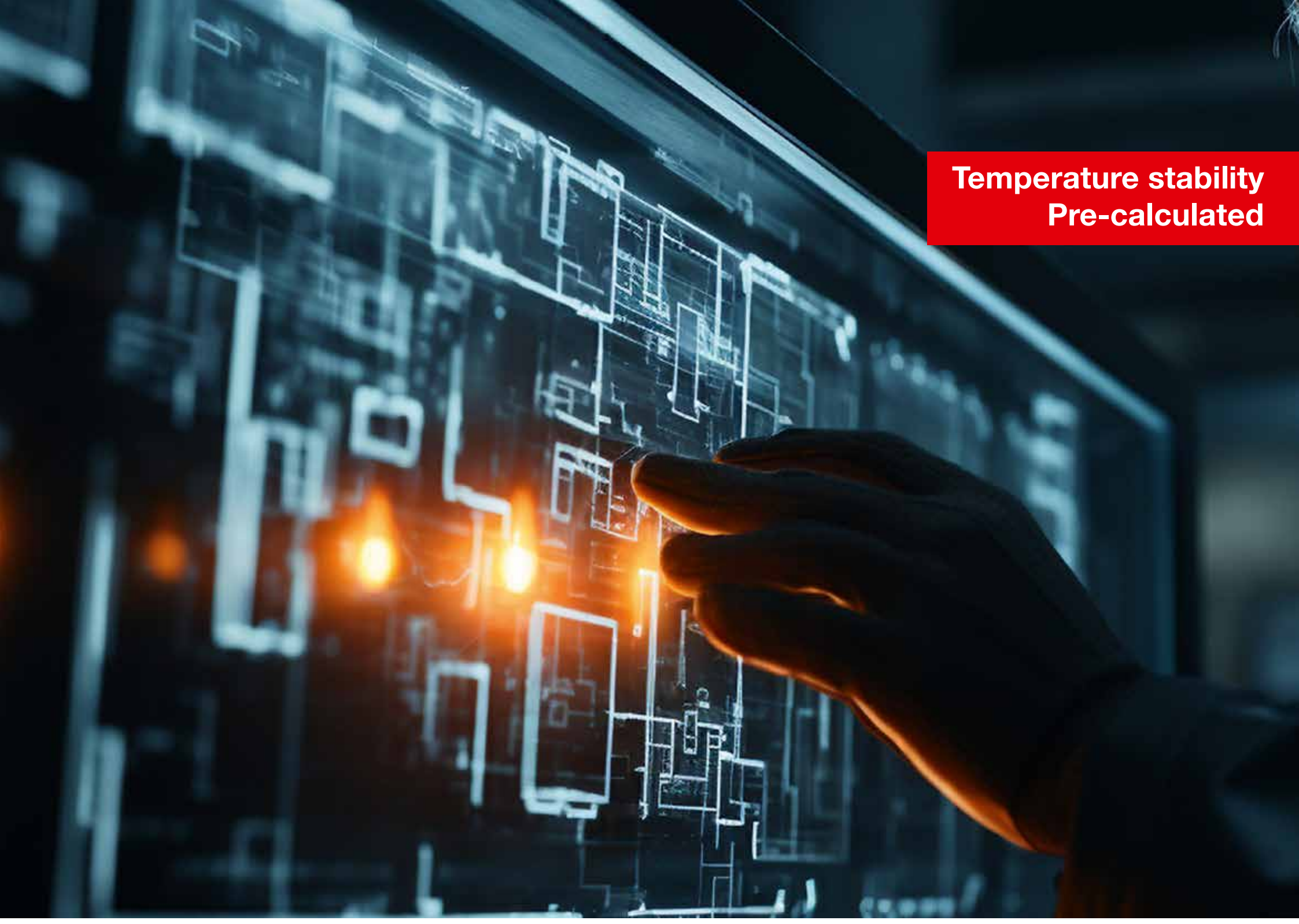


The exceptionally heavy-duty machine bed, only the best, top-flight linear guides and precision assembly ensure the best wire-cutting results in the long term. The slides of the linear guides come with play-free bearings without contact between the ball bearings during movement – for maximum smoothness of motion and almost no rolling resistance.

Spheroidal graphite iron leveled by ultra-precision grinding.



A solid cast provides the best machine bed for the 8-fold supported linear guides. This ensures that your MX900 is not only ultra-precise but will remain so for a decade and beyond...



Greater accuracy with challenging workpieces

through thermal decoupling and pre-control

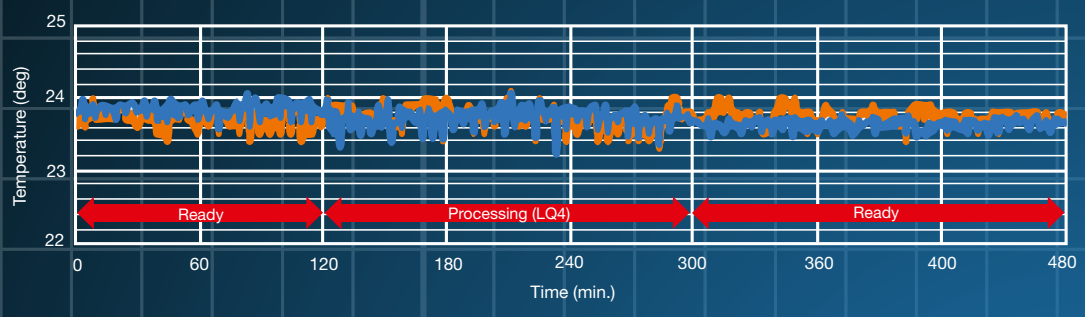
RIS
RIGIDITY &
ISOLATION
STRUCTURE

Temperature management of the MX900

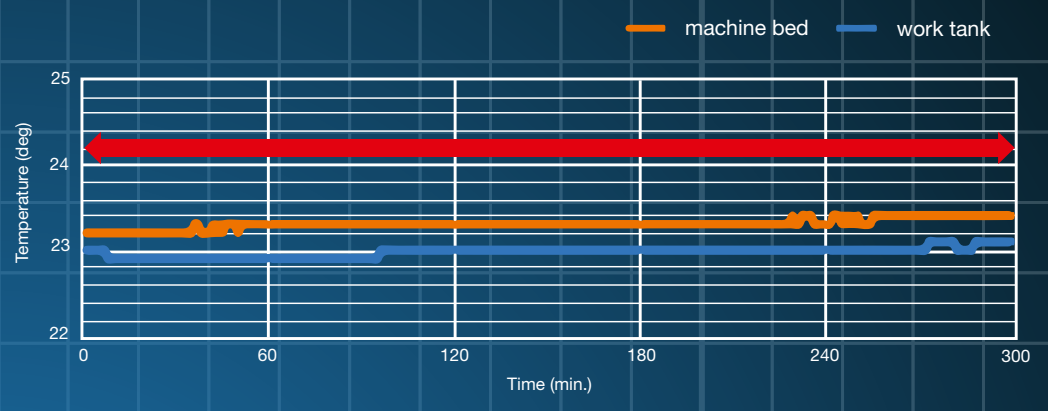
The temperature management of the MX is based on two pillars. First, external influences are minimized by decoupling the work tank and erosion area from the external environment. Second, the heat generated by pumps, other components, and the erosion process itself is pre-calculated and proactively compensated.

This is crucial because thermodynamic processes take time, and simple adjustments made later are too late for the required precision, leading to a loss of accuracy. The MX900 is simply better at anticipating these challenges.

temperature variation during erosion



Temperature change during threading



The Tubular Shaft Motor converts energy directly into motion, without contact, without maintenance and above all without loss of precision – long-term. Combined with the 400% faster fibre-optic-based control, this superior technology can truly show what it is capable of.

The positioning accuracy of the MX900 is < +/- 1 µm over the entire travel path – there's a genuine 12-year manufacturer warranty for this on all Mitsubishi Electric EDM systems. An assurance of top-level durability.

Your company's technological edge has a name: Tubular Shaft Motor – from world market leader Mitsubishi Electric.

Find out more about it here:
qr.mitsubishielectric-edm.de/tubular_en

The perfect drive
on positioning accuracy.

ODS
OPTICAL
DRIVE
SYSTEM

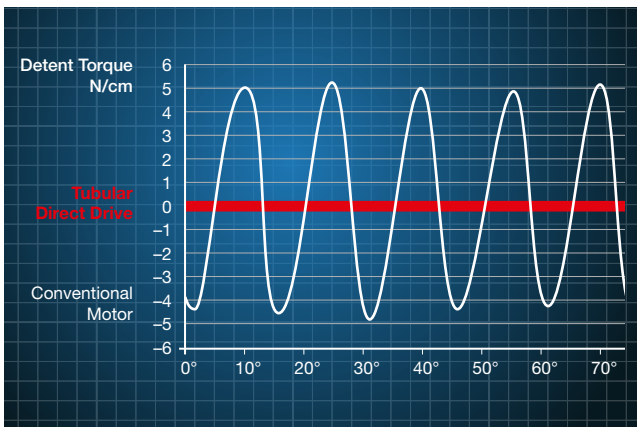
Perfect drive

What was it about conventional drive systems that bothered developers at Mitsubishi Electric? The need for lubrication, the friction and frictional heat, power consumption, backlash, the cogging moment and above all the possible wear. Only a non-contact drive overcomes these drawbacks from the outset and is thus an assurance of better results and enhanced dependability over decades.

Speed of light

The Mitsubishi Electric polymer optical fibres have decisive advantages – not only over conventional copper cables, but also over glass fibres. Not only their total resistance to water, but also their high transmission rates combined with minimal space requirements and maximum flexibility are essential for truly progressive EDM systems. The only thing that you as a user notice is the longer service life and enhanced precision.

No disruptive cogging torque



You're surely familiar with the cogging torque manifested by a conventional electric motor. It is precisely this cogging torque that is undesirable, as are variations in torque. The tubular direct drive has neither and is therefore the optimum drive for precision applications such as spark erosion.

Brilliant Finish
- as good as Ra 0.04 µm in tungsten carbide
- in steel < Ra 0.10 µm
- even and particularly where complex geometries are concerned

Workpiece Specifications
Material: Tungsten Carbide (KD20), 20mm
Eroding wire: 0.20 mm brass
Surface roughness: 0.04 µm Ra

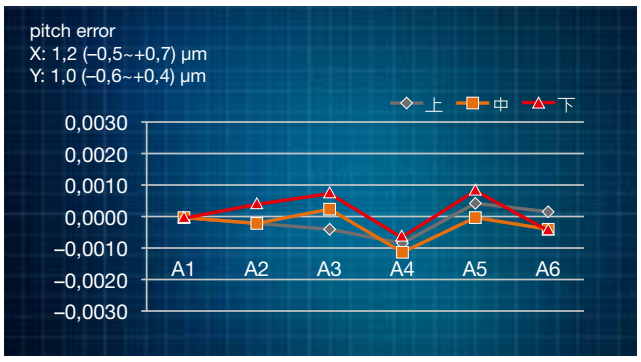
It’s the result that counts.
How to achieve it with µm precision.

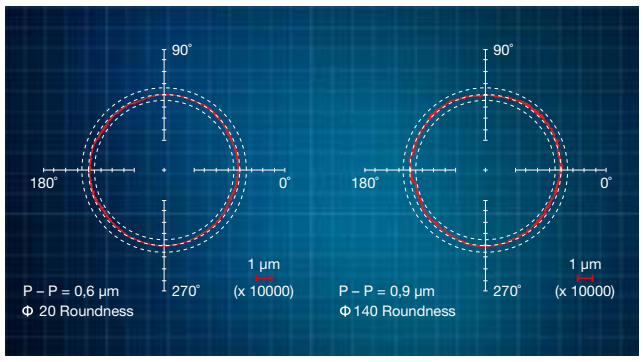
PFC
PRECISE
FINISH
CIRCIUT

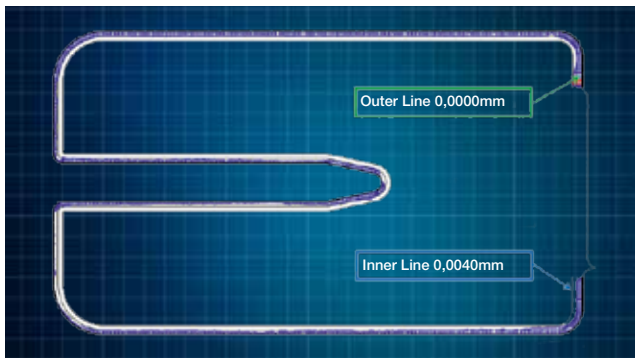
Positioning accuracy all the way
Positional variation less than 1 µm over the entire 300 mm travel path.

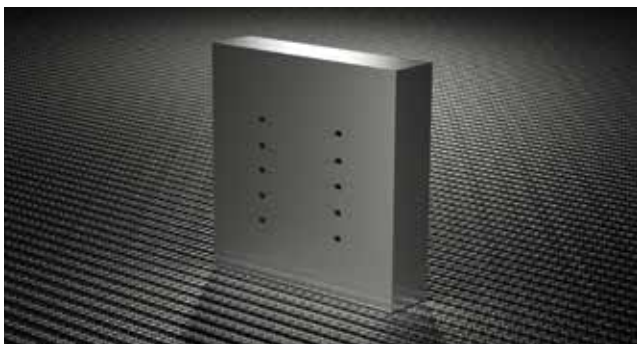
Full circle
30 mm circle and 20 mm cutting height with precision of 0.73 µm in circularity.

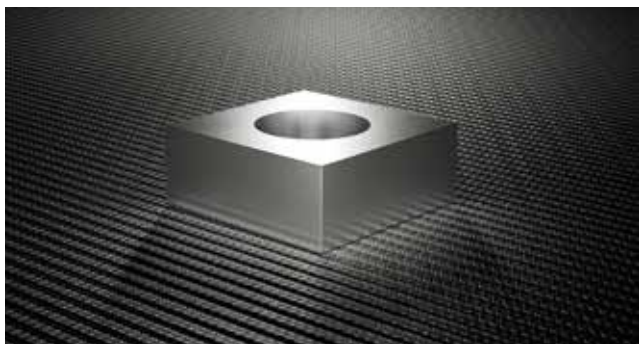
It’s the contour that counts
± 1 µm – maximum dimensional accuracy here taking the example of a 40 mm tall component.











Threading even in the most difficult conditions

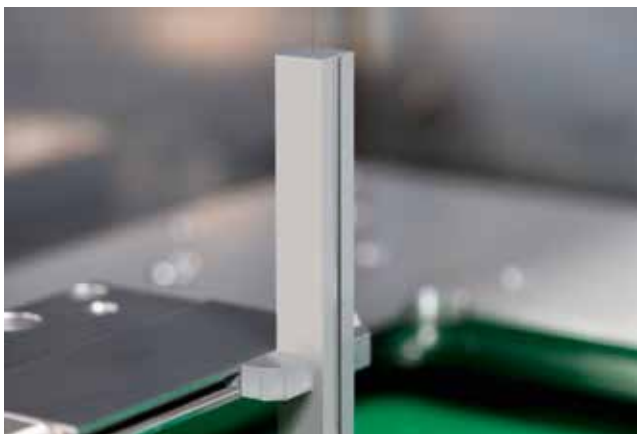
Find out more about it here:
qr.mitsubishielectric-edm.de/threader

Patented
Automatic wire threading for any eventuality

Vastly superior.
The wire threader for maximum dependability.

AT
INTELLIGENT AUTO THREADING

Wire break point insertion

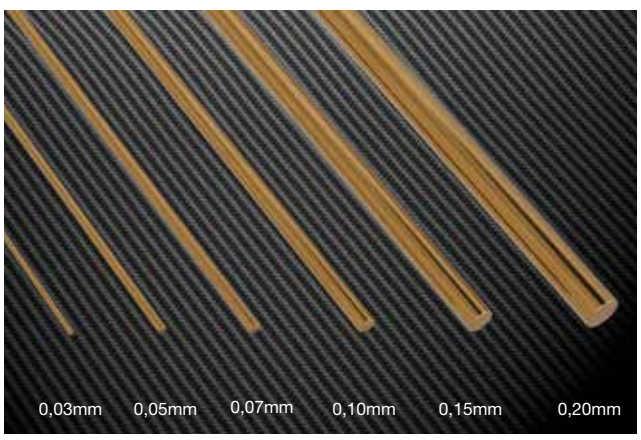


Automatic threading in the tiniest start holes, even in difficult applications. The innovative flow analysis for the jet stream takes the effort out of your work.

Round diamond guide

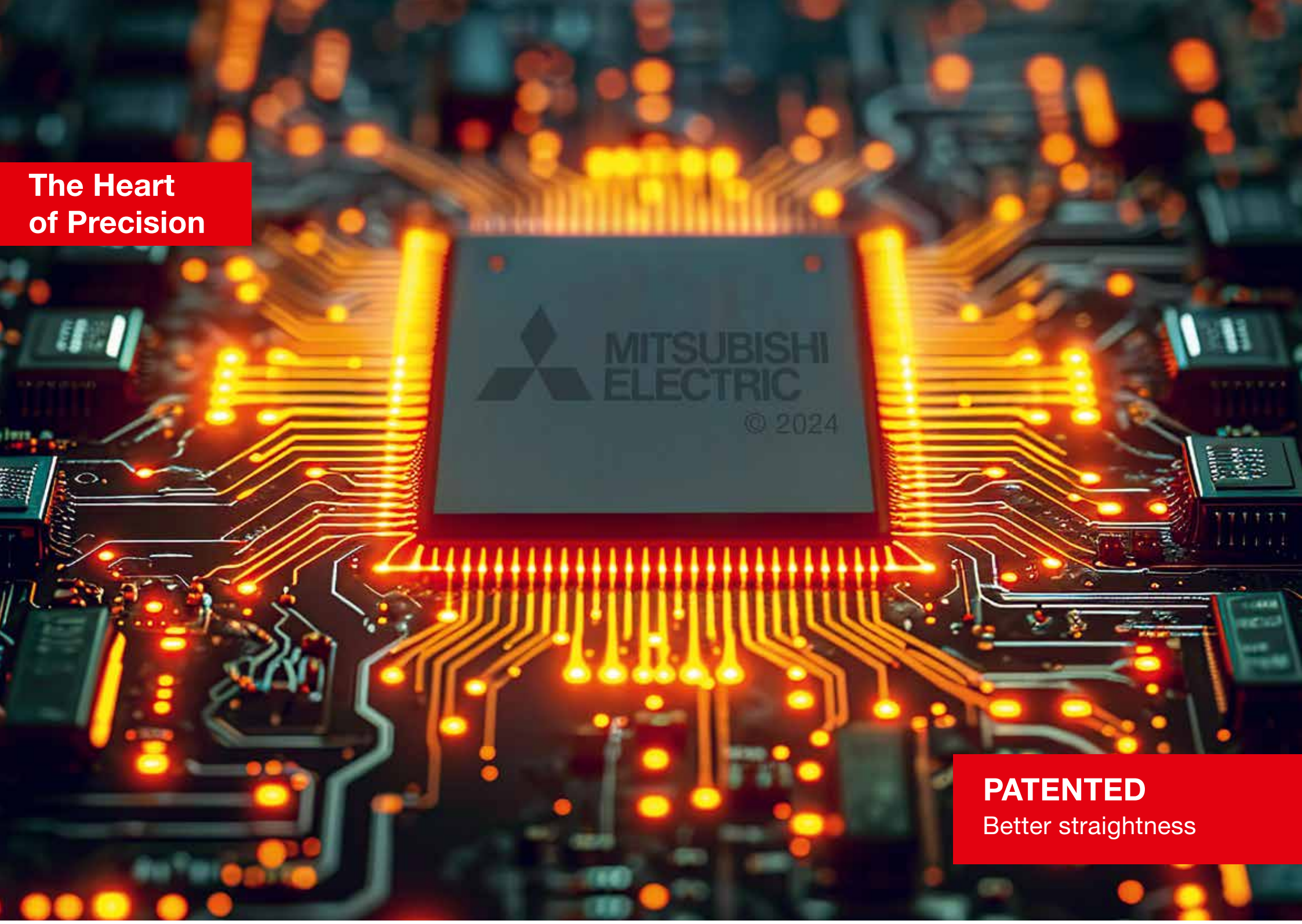
Maximum precision and durability ensure the best results in the long run – inclusive of maintenance-friendliness due to a small number of parts and simple design.

Flexibility – when it comes to wire diameter



The Intelligent AT in the MX900 is designed as standard for wire thicknesses of 0.05–0.20 mm (0.03 mm available as option). The right range for all applications.

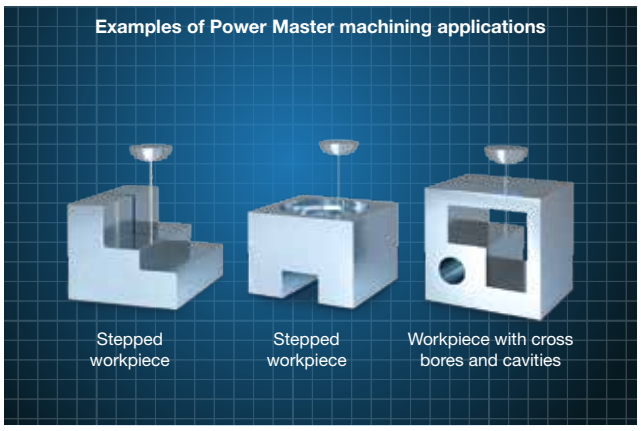
Learn more...
qr.mitsubishi-edm.de/threader_mx



Precision for steps
and around corners.

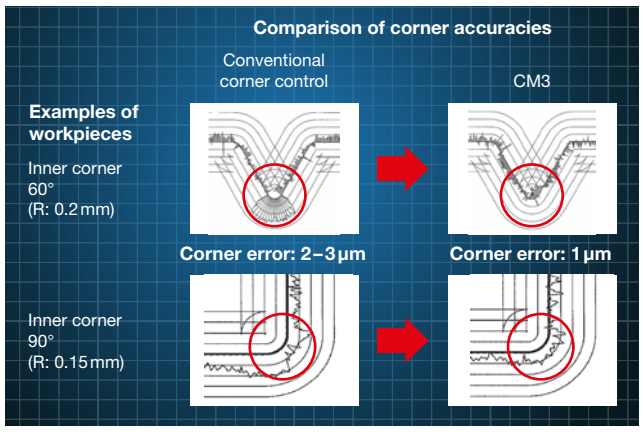
PFC
PRECISE
FINISH
CIRCIUT

Process Control at its best – Power Master



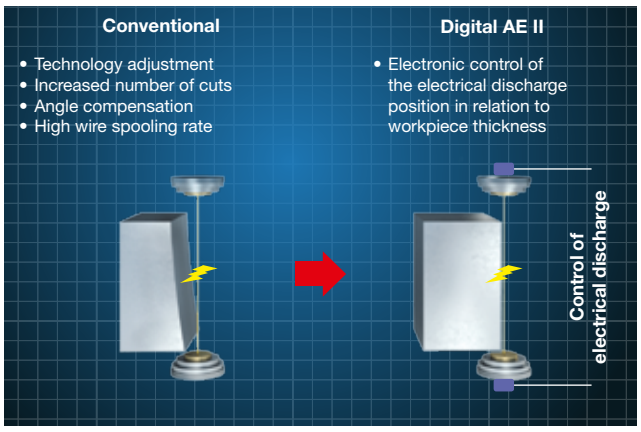
The Power Master Control gives the most highest level of process stability – whatever the shape being cut. Stepped workpiece shapes, boreholes and other obstacles to a stable cutting process are identified as soon as they appear and the control adopts cutting and flushing parameters for a safe process and superlative accuracy.

Getting a grip on radii and corners



On small inner and outer corners and complicated geometries, Corner Master 3 comes to your aid. You merely define your priorities, and optimisation is performed accordingly.

Better straightness and shape accuracy



With precise control of the electrical discharge position, material is only removed where it needs to be. The patented functions of the Digital AE II improve rough and fine machining and fine finishing – in terms of both precision and machining time.

The button that can program ... program really well…

Even I, as a sales manager, can suddenly program...

Hans-Jürgen Pelzers
Sales Manager at
Mitsubishi Electric EDM

TO THE VIDEO
Scan now!
qr.mitsubishielectric-edm.de/xedm_en

XEDM

Smart user guidance and automatic programming.

NUI
NATURAL USER INTERFACE

XEDM Programming System
Brings massive improvements for you as a user, it programs for you and checks the result. This way, costly errors are avoided from the start.

Programming without Training

As a user, I can make CAM changes directly on the machine control. Simple and intuitive for quick and reliable NC programs. Tailored for application directly in production.

Self-explanatory Simplicity!

I can easily control the cutting sequence:
- Sequence (e.g., first all main cuts, etc.)
- Timing of detaching scrap parts (immediately, after the main cut, or separately after skim cuts)
- Further settings (e.g., partial processing), etc

XEDM and EXPRESSCAM - The Strong Team

Convenient with the same user interface in Xpress-CAM for the PC and XEDM. Users find it particularly easy because a shared data source allows seamless preparation on the PC, including technology selection. Changes can also be made directly on the machine with XEDM - saving time.

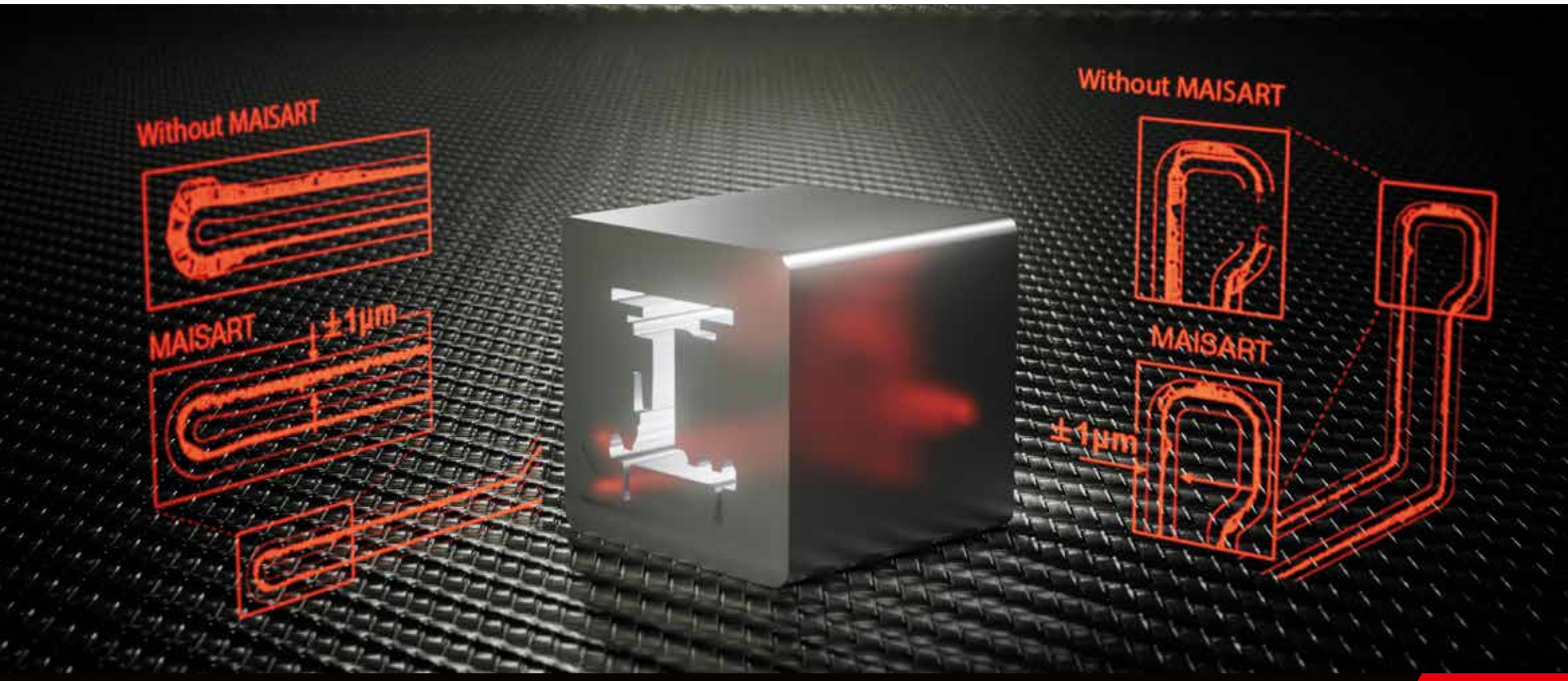
Learn more...
qr.mitsubishi-edm.de/me_xedm_en

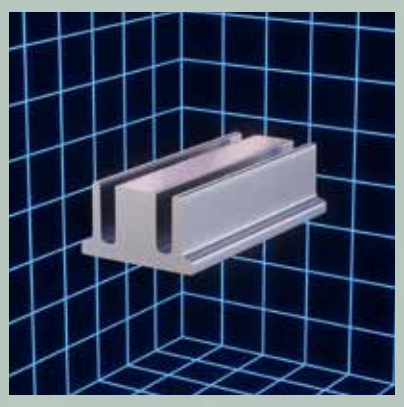
Unleash the Genius in Your MX900

Master the smallest corners
Excellently with MAISART

NUI
NATURAL USER INTERFACE

Produce previously impossible precision with particularly small radii reliably. The artificial intelligence solution developed by Mitsubishi Electric for over half a decade, named MAISART, makes it possible. See for yourself and look forward to ultra-precision





If time is of the essence or you want the machine to take some of the work off your shoulders. Set-up often takes too long; from now on, you can save this time.

Highly accurate probing cycles on the sides and the corners measure the workpiece precisely. With or without jet stream or even submerged by means of the cutting wire or with the optional 3D touch probe – just as you wish.

Clamp it and press *Start*!

Smart user guidance, easy work set-up.

NUI
NATURAL USER INTERFACE

Fully automatic alignment cycles

Intelligent user guidance takes you to the finish. The electrical discharge machine takes you quickly to your goal.

Manual control

Comfortable set-up with the manual control box: standard equipment with Mitsubishi Electric. All essential control functions at hand – wherever you need them.

3D position measuring – manual or automatic

Both are possible. As a user, you decide whether you do set-up classically by hand or the machine automatically defines the position of your workpiece. Using the cutting wire or pick-up coil – the machine takes care of it for you. It only takes the press of a button.

Digital as you wish...

Your Digital Shopfloor for Your Machines from the WBA
Toolmaker Klaus Baier increased his productivity by 387%. You too can boost your productivity with the WBA...

Learn more ...
qr.mitsubishielectric-edm.eu/wba_en

WBA
WERKZEUGBAU
AKADEMIE

Option

NUI
NATURAL
USER
INTERFACE

Your MX900
Always ready at hand

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 with the intelligent AT wire threader.

mcAnywhere Service
Rapid help from Mitsubishi Electric experts.

mcAnywhere Live Service
Machine running, thanks to Live Service without travel time. A Mitsubishi Electric technician looks at your machine and solves your problem. No solution, no costs—this is how results are achieved.

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

mcAnywhere Contact+
Any time, any place ... you're always up to date with direct status reports by email. Status reports can be optionally sent by text message – a GSM modem with a suitable driver can be added for this.

Twice-as-fast spark detection
The high-speed digital control works up to twice as fast as traditional machines. A great basis for immaculate component results – in terms of geometrical trueness and surface roughness.

Pulse duration: 1 billionth of a second.

The royal road to nanoprecision.

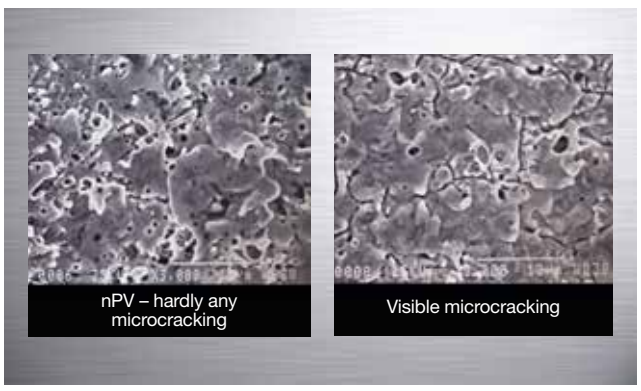
nPV
NANO
V-POWER
SUPPLY

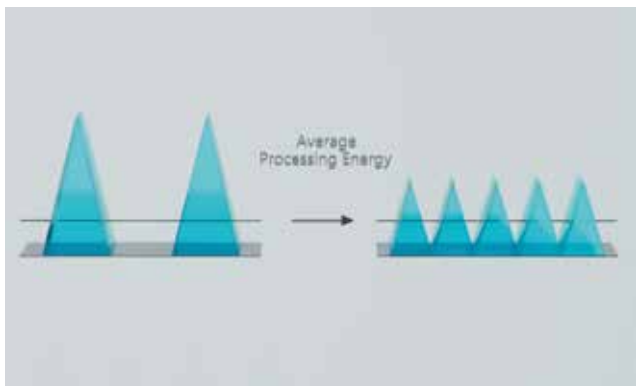
Response time is decisive
The lower the energy input, the better and more stabile the cut edges. A larger number of shorter pulses achieve the highest precision ever coupled with good cutting speed – minimising microcracking in the material as a side-effect. The reduced damage in the edge zones and better structural integrity yield much extended service life, and not only that of stamping tools.

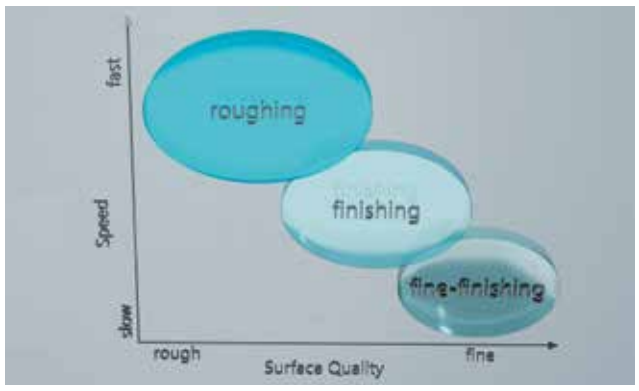
Extremely low risk of microcracking
The special feature of the MX900's nPV Generator designed for dielectric oil is its gentle application of energy to the workpiece. Extended tool life for cutting punches and other similarly stressed components is an inevitable consequence.

Good removal rate and superlative surface quality
The new nPV Generator succeeds in using the same quantity of energy to machine the material while significantly reducing the energy peaks on the workpiece. This is achieved by applying lower energy to the workpiece at higher frequency.

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







Lasting precision

and extra maintenance-friendliness.

LLS
LONG
LIFE
SYSTEM

Cutting wire replacement

92 sek

Simply replace the spool and feed the cutting wire over the feed rollers. Everything ready for work again in 92 seconds.

Now watch:
qr.mitsubishi-edm.de/spool_mx

Automatic central lubrication

0 sek

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.

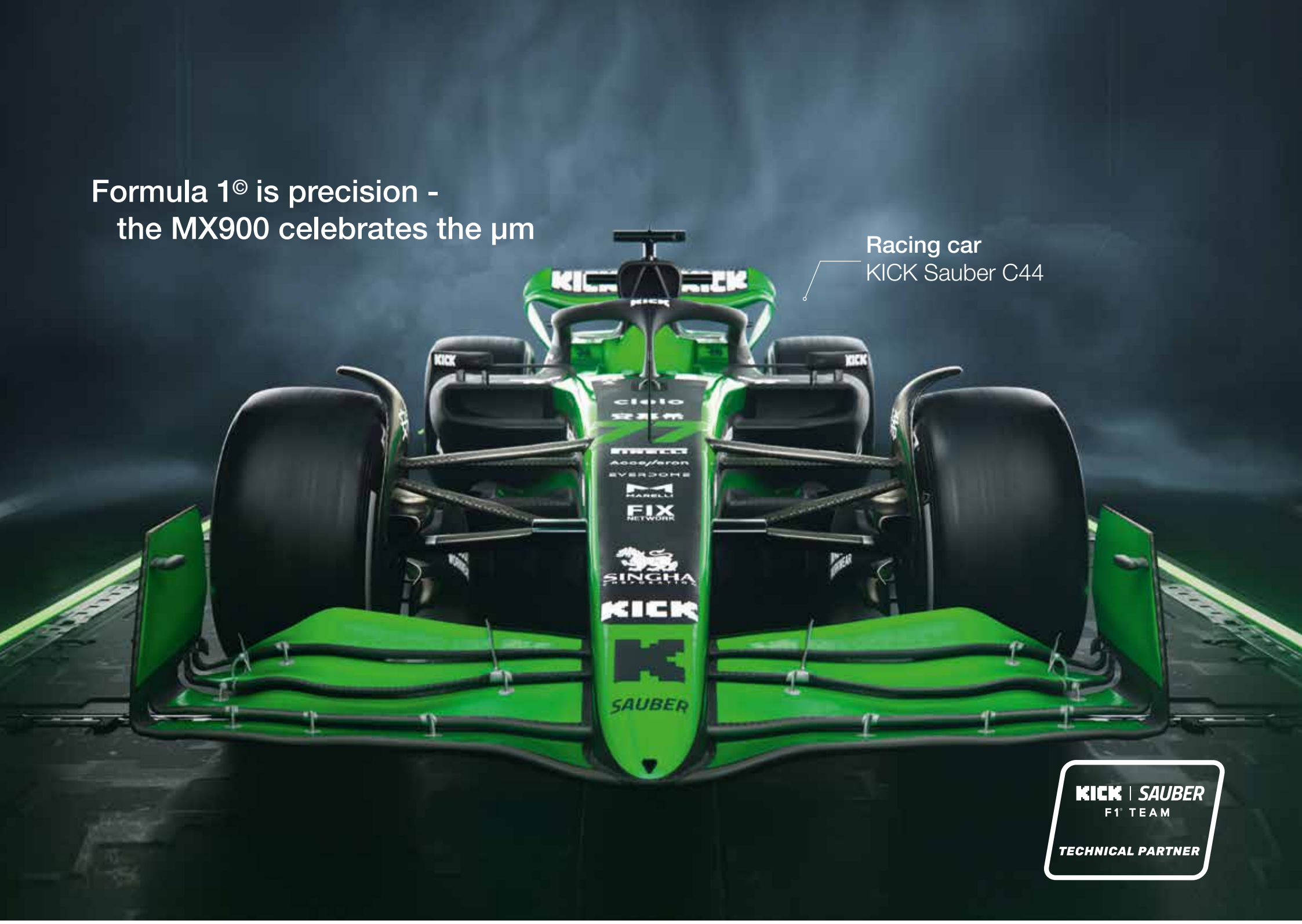
Now watch:
qr.mitsubishi-edm.de/oil

Changing the power feed contact

5 sek

Replace the power feed contact with just one hand and a small gauge – at speeds like in Formula 1©.

Now watch:
qr.mitsubishi-edm.de/power_mx

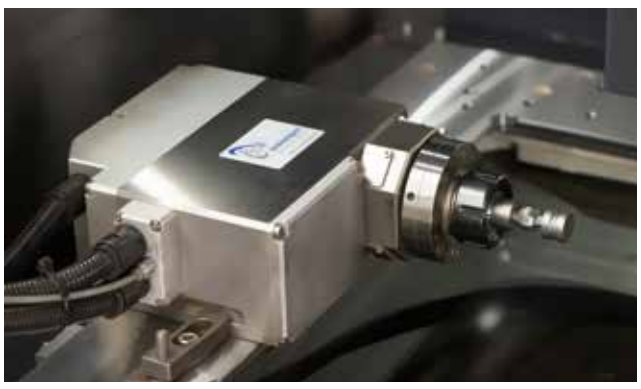


More axes.

A chance to extend your options.

Option

B-axis



A servo-controlled B-axis fully integrated in the machine controls permits wire cutting on a rotating carried workpiece. Separation and multi-sided machining can be performed in a single clamping as well as simultaneously.

Mini-rotational axis

Rotating spindle also fully integrated in the machine control with positioning for the most minute high-precision components, e.g. the manufacture of ejector pins with a diameter of ≥ 0.05 mm, the realisation of conical threads in medical technology, erosive grinding, turning and simultaneous machining.

ERGO-LUX

Working conditions that are kind to your eyes – for the sake of users and for the benefit of machining results.

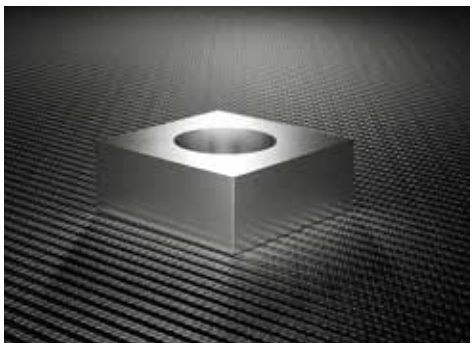
Warning lamp

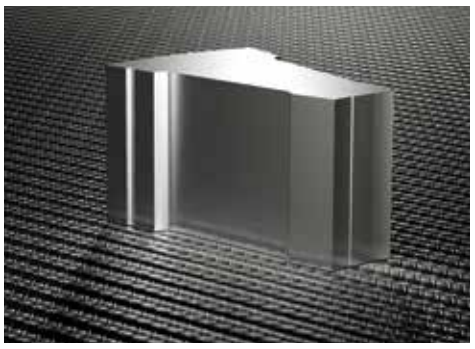
Under scrutiny at all times – the status light visible from a distance leaves you in no doubt. LED technology makes the difference.

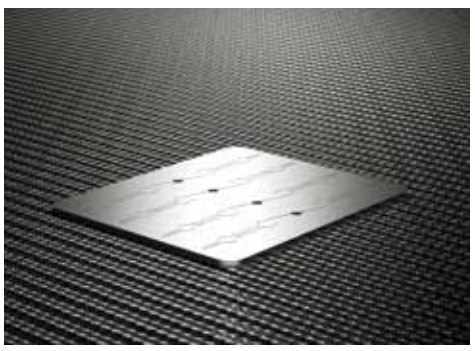
Successfully mastered!

The success factor in a wide range of fields.

Medicine · Vehicle industry · Communications / Electrics · Aerospace · Watch industry





Service hotline: +49 (0) 2102 486 7600
Application support: +49 (0) 2102 486 7700
Monday to Friday: 7.30 am to 8 pm / Saturday: 9 am to 4 pm (CET)

Service.

We’re there to help you.

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. 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.

Warehousing and logistics

We supply all in-stock products (wear and spare parts) even outside normal business hours, e.g. by courier or collection. Our proximity to Düsseldorf Airport and motorway links enables us to ship parts at high speed.

Original Mitsubishi Electric parts

All standard spare parts of the Mitsubishi Electric consumables line are original imports or fabricated in Germany in accordance with the development and design specification. You receive original parts of immaculate quality at attractive prices.

Support when you need it

With strong support from Mitsubishi Electric by phone, via McAnywhere Live, or on-site, your machine runs according to plan.

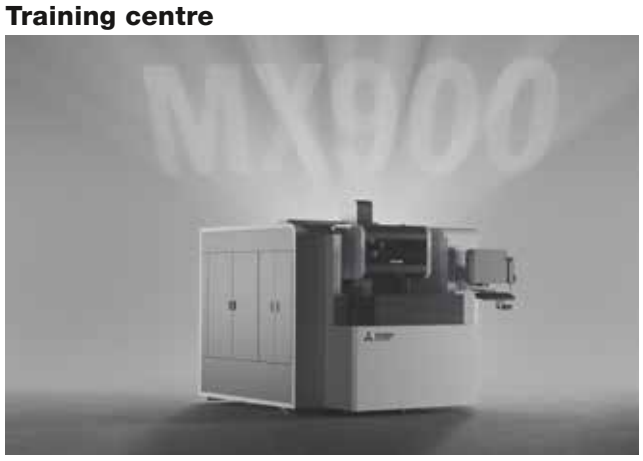
Training.

Helping you to stay up to date.

Training

Users learn skilled operation right at the machine and at specially configured CNC workstations. This way you benefit most from a direct transfer of expertise. Training is available at the facilities of Mitsubishi Electric in Ratingen, Germany. Additionally, training courses are provided by our international partners.

Training centre



Training on our wire-cutting and die-sinking systems takes place at our own technology and training centre in Ratingen.

Learn more...
qr.mitsubishi-edm.de/trainings

Courses, seminars and user workshops

The varied programme covers everything from basic knowledge through to customised training geared precisely to your employees' learning needs. In addition, we also hold regular applications workshops – free of charge to our customers – which always deal with current topics in theory and practice.

Equipment and instructors

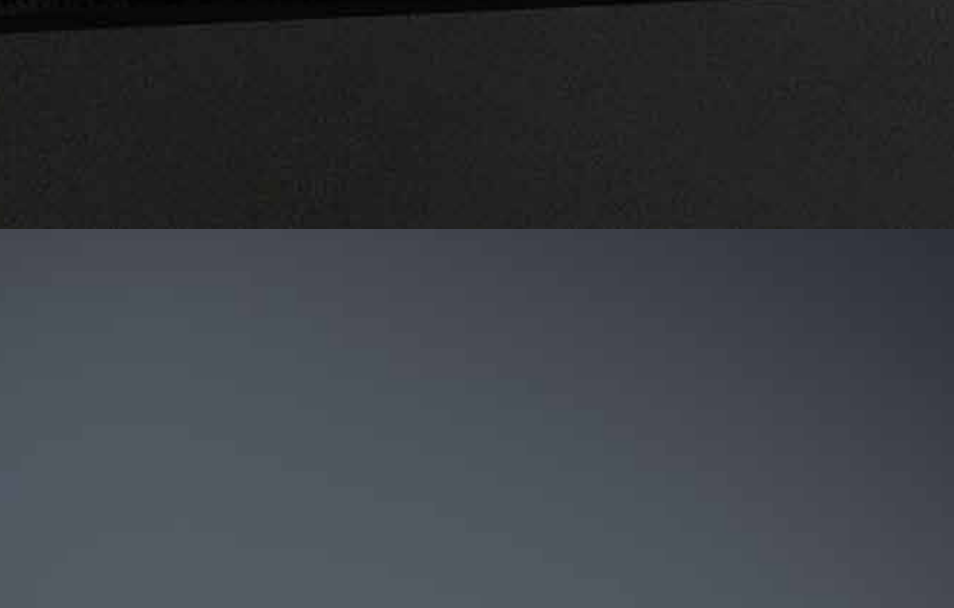
Our skilled instructors introduce you to our EDM systems in theory and practice. The training facilities are appointed with the latest technology, CNC simulators and peripheral equipment.

Certificates

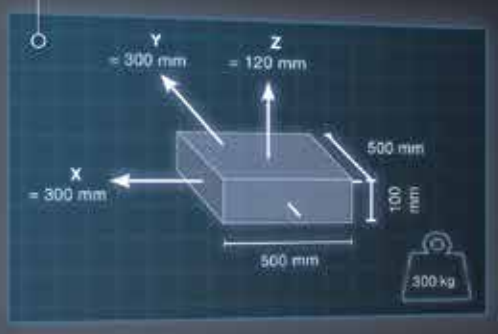
All training participants receive a certificate on completing a course.

Technology and soul
signed in stainless steel ...

MX900



Workpiece



Machine weight.....3400 kg
Generator weight.....240 kg
Machine height.....2203 mm

Required minimum dimensions for
Door/Gate passageways (w x h) in mm.....2400 x 2300

Machine plan

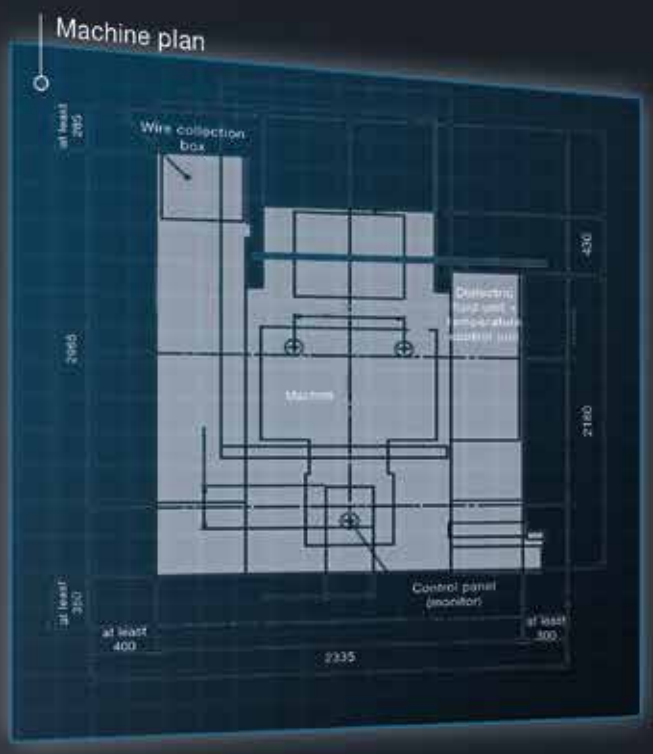


Table layout

Machine	MX900
Travel (X/Y/Z) in mm	300/300/120
Travel (U/V) in mm	(+/- 35)
Taper angle (workpiece height) in °/mm	Max. 15°
Max. workpiece dimensions (W x D x H) in mm	500 x 500 x 100
Max. workpiece weight in kg	300
Table dimensions (W x D) in mm	560 x 505
Table layout	Hardened 4-side table
Possible wire diameters in mm	0,05–0,2
Wire spool capacity in kg	10
Automatic wire threader/wire chopper	Yes
Overall dimensions (W x D x H) in mm	2335 x 2965 x 2203
Machine weight in kg	3400
Mains voltage	3-phase 400 V/AC ± 10%, 50/60 Hz, 13 kVA

Filter System	
Tank capacity in l	325 (Initial filling 350 l)
Filter particle size in µm/filter elements	3/2
Temperature control	Dielectric cooling unit
Weight (dry) in kg	Included in machine weight

Generator	
Power supply unit	Regenerative transistor pulse type
Cooling method	Fully sealed/indirect air cooling
Max. output current in A	50
Dimensions (W x D x H) in mm	Integrated in the machine module
Weight in kg	Included in machine weight

Control Unit	
Input method	Keyboard, USB flash drive, Ethernet, 19” touchscreen
Control system	19“ touchscreen/CNC, closed circuit
Min. command step (X/Y/Z/U/V) in µm	0,1
Min. axis resolution in µm	0,05

Equipment	MX900
Tubular Shaft Drives with linear scales (X/Y/U/V)	Yes
Control M800 with 19” full-touch monitor	Yes
Hand pilot with configurable LCD monitor	Yes
Automatic vertical front door	Yes
Digital AE II generator	Yes
Hardened 4-side frame table	Yes
Ethernet/DNC/FTP	Yes
McAfee AntiVirus embedded	Yes
Sleep mode	Yes

Optional Hardware	MX900
Thin wire specification 0.03 mm	Optional
Angle Master Advance II – basic kit incl. aligning device	Optional
Angle Master Advance II – Wire guide kit	Optional
External signal output with relay board	Optional
Tricolour status lamp	Optional
Automatic Renishaw probe	Optional
ERGO-LUX LED floodlight	Optional
Renishaw touch probe	Optional
Additional axes/rotational axis	Optional

Optional Tools	
mcAnywhere Service / Live Service	Yes
mcAnywhere Control/mcAnywhere Control light	Optional
mcAnywhere Contact/mcAnywhere Contact light	Optional/Yes
Tool package/automation solutions	Optional

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

Pneumatic connection: 5–7 kgf/cm², 500–700 kPa, air flow rate min. 75 l/min, 3/8“ hose connection

The EDM system should be installed on a suitable hard industrial floor, preferably a compacted concrete floor. Shielding measures that may be required according to the EMC Directive are not included in the scope of supply from Mitsubishi Electric.

The cooling unit contains the fluorinated greenhouse gas R410A. Further information can be found in the corresponding operating manual.

Details can be found in the machine installation plan:
qr.mitsubishielectric-edm.eu/downloads_en

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