



Perfect mastery of surfaces



BE A CHAMPION  
IN EVERY MATCH

OPS  INGERSOLL  
Fly with the eagle!

Champion tactics: highly dynamic, clever, superior.

## Intelligent power setup wins



**Rainer Jung, Managing Director**  
Developer, Mastermind, Enthusiast

The advanced power setup of the G-Line means a substantial boost in speed for modern EDM technology.

A well-organised game plan will make you a superior champion! With the G-Line you will be perfectly equipped to score points as an expert with tremendous precision and intelligent automation solutions. Our demanding team training focuses on a single goal: to coach you to be a winner.

The new machine concept of the G-Line is a clever and profitable choice for the future!

**Be an Eagle Team – be a champion!**

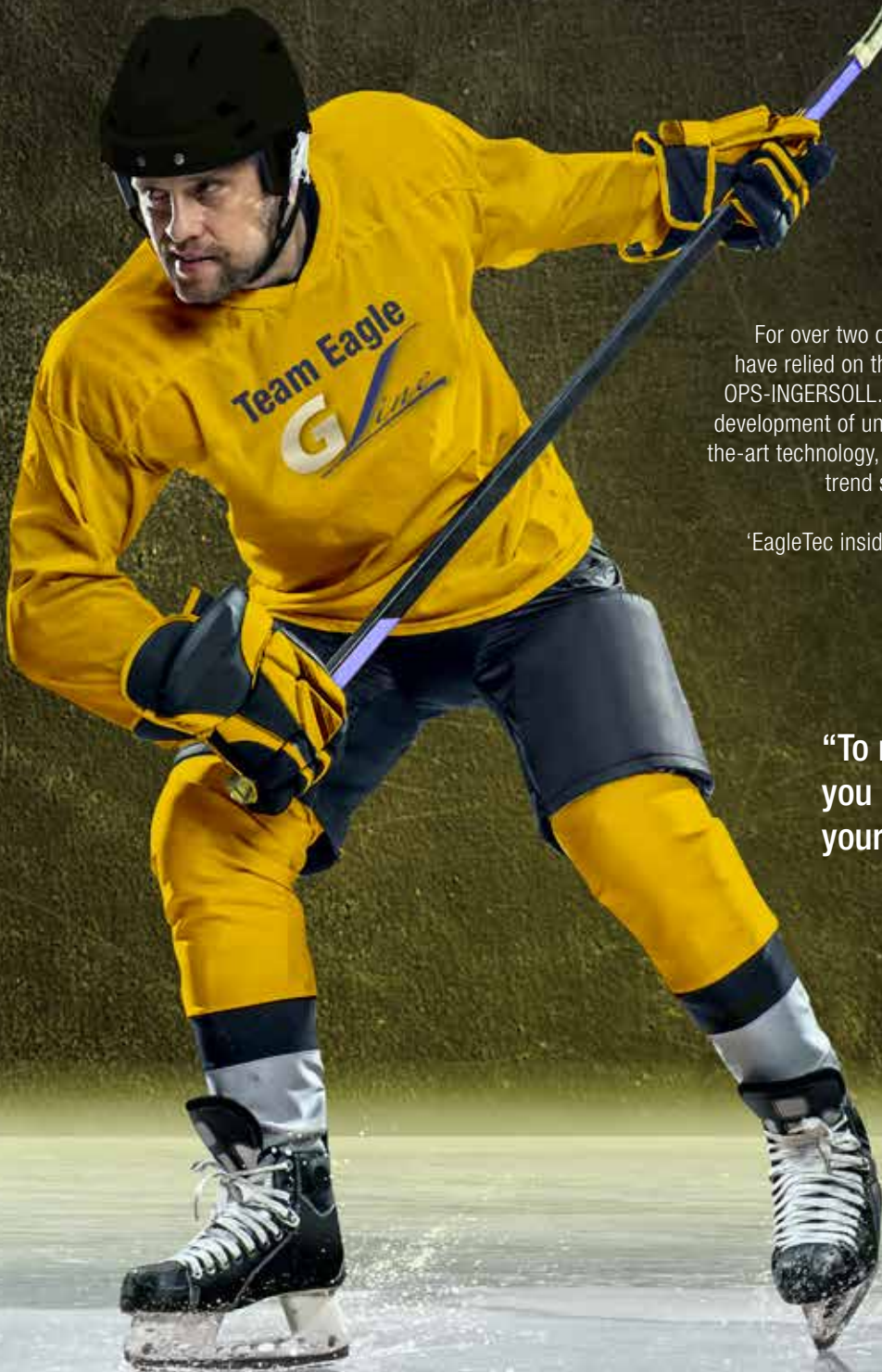
**“Being in the lead means: Being there even before you arrive.”**

**Michael Schumacher**  
Racing driver



FLY WITH THE EAGLE

# DEVELOPMENT RESEARCH INNOVATION TREND SCOUTING



## **EagleTec inside**

---

For over two decades now, our customers around the world have relied on the strong innovative capacity of the experts at OPS-INGERSOLL. The permanent and continuous research and development of unique performance components, with state-of-the-art technology, provides our customers with highly-profitable trend scouting and long-lasting investment security.

'EagleTec inside' is a commitment and a pioneering promise for every machine that leaves our factory. For our customers and our employees. We want to inspire everyone.

**“To make the right play,  
you have to know the moves  
your teammates will make.”**

Big Points

# Diversity of business sectors



Tool and mould construction

Pressing and metal forming

Aerospace technology

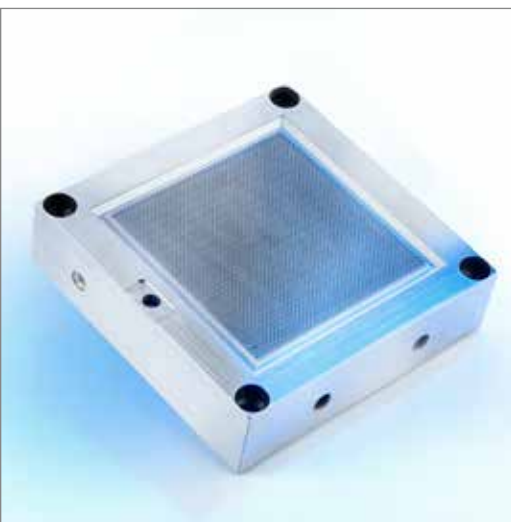
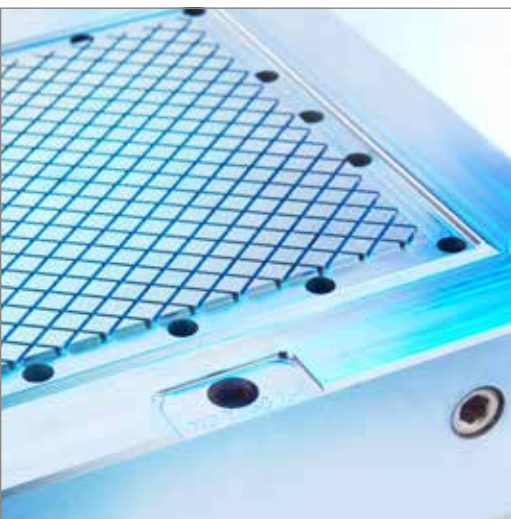
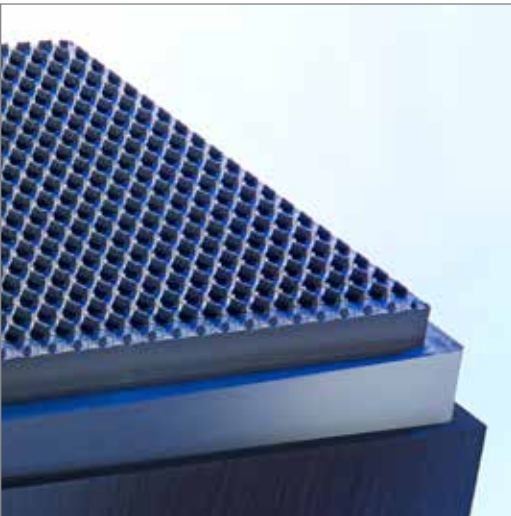
Dental and medical technology

Moulds for optical  
components

Micro-machining

Precision part machining

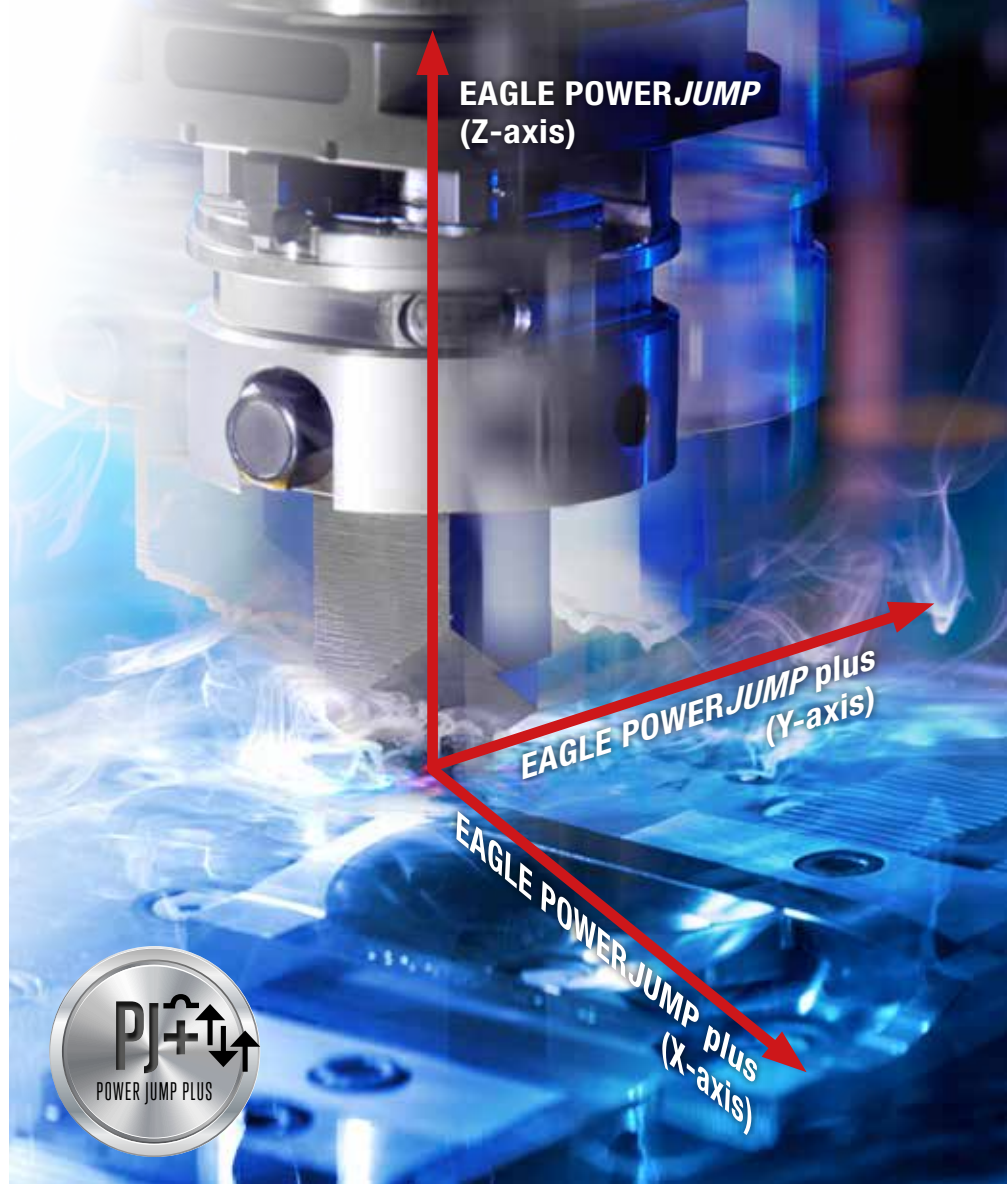
OPS-INGERSOLL offers efficient  
solutions to boost productivity.



# Increased efficiency

## Power Jump!

Optimal flushing is essential for excellent electric-discharge machining results, even under the most difficult conditions. The EAGLE POWERJUMP with lifting speeds of up to 18 m/min achieves this easily. It also drastically reduces idle time and significantly shortens machining time. The movement is adapted to the prevailing conditions based on the size of the electrode and the type of application.



# Precision recirculating ball screws in all axes



# Unique gantry machine concept

## Excellent machine design

Highly integral gantry design for optimal temperature stability

**Thermo-symmetric design** with unique temperature compensation

**Gantry** construction for maximum precision even in the case of high top loads

**C-axis** with extreme rigidity for use of electrodes weighing up to 50 kg

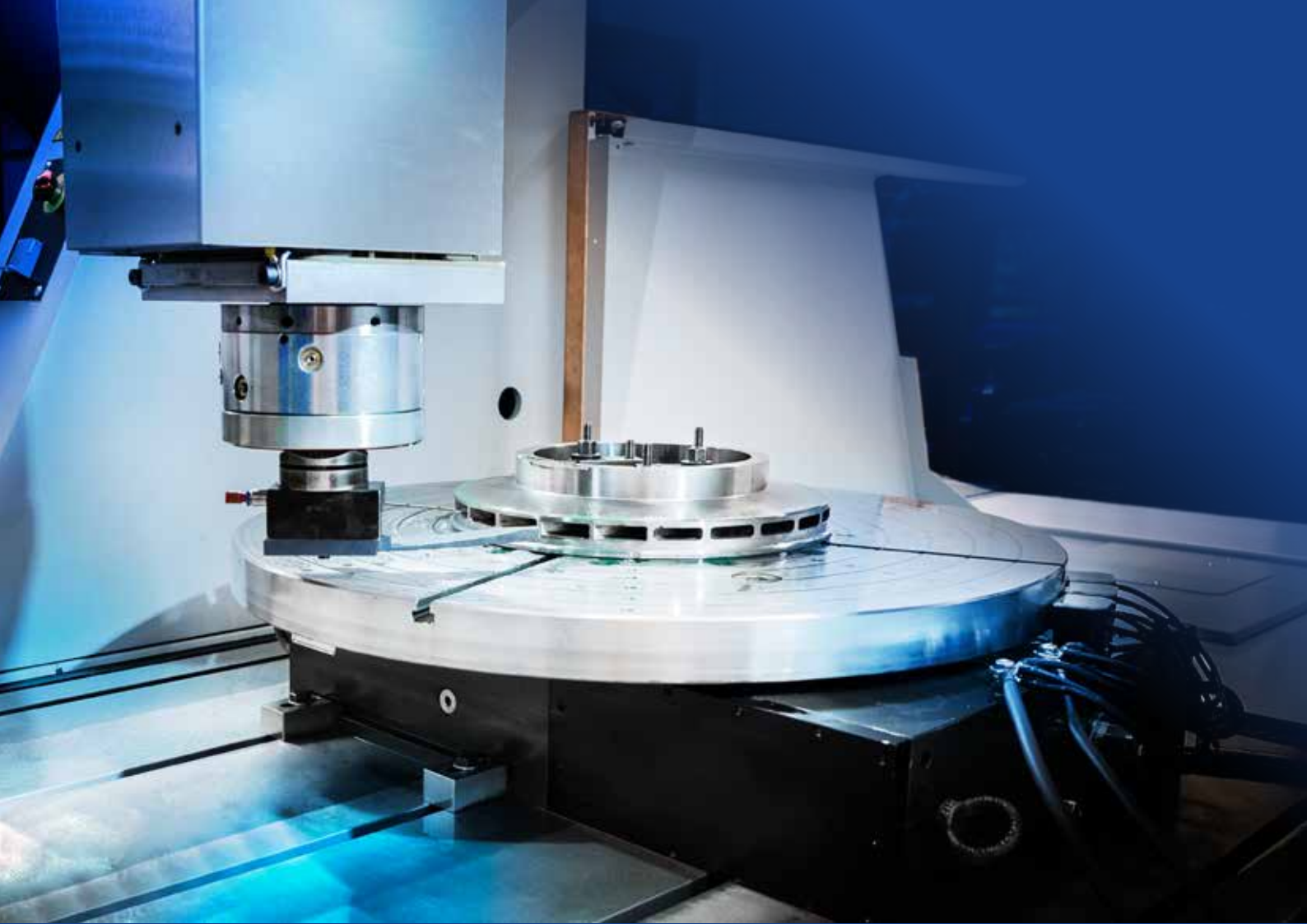
Optimal **automation** with perfect manual control



Integrated **dielectric** tank in the machine bed for maximum temperature stability and flow optimised infeed

Automatic tank guidance with **precision recirculating ball screws**

Minimum **footprint** – maximum **travel**



5<sup>th</sup> axis for indexing mode

## 5<sup>th</sup>/6<sup>th</sup> axis

Electric-discharge machining is no longer limited to Z movement. The EAGLE POWERTEC controller can control up to six EDM axes simultaneously. Whether for indexing in production or completely integrated for complex tasks.

### **Axis in indexing mode**

Workpieces can be machined on all sides in a single clamping setup due to fully automated indexing to the next position. Elimination of manual reclamping reduces idle time and extends the unattended operating time of the machine many times over. This not only improves efficiency, but also ensures maximum precision and repeat accuracy.

### **Fully integrated EDM axis**

Full integration of up to six EDM axes substantially increases the application spectrum to allow the production of workpieces with much more complex geometries. In addition to the EDM tasks, it is also possible to automate the calibration of large and complex 3D components. The use of RTCP ensures that the electrode and workpiece are correctly aligned in all axes at all times.

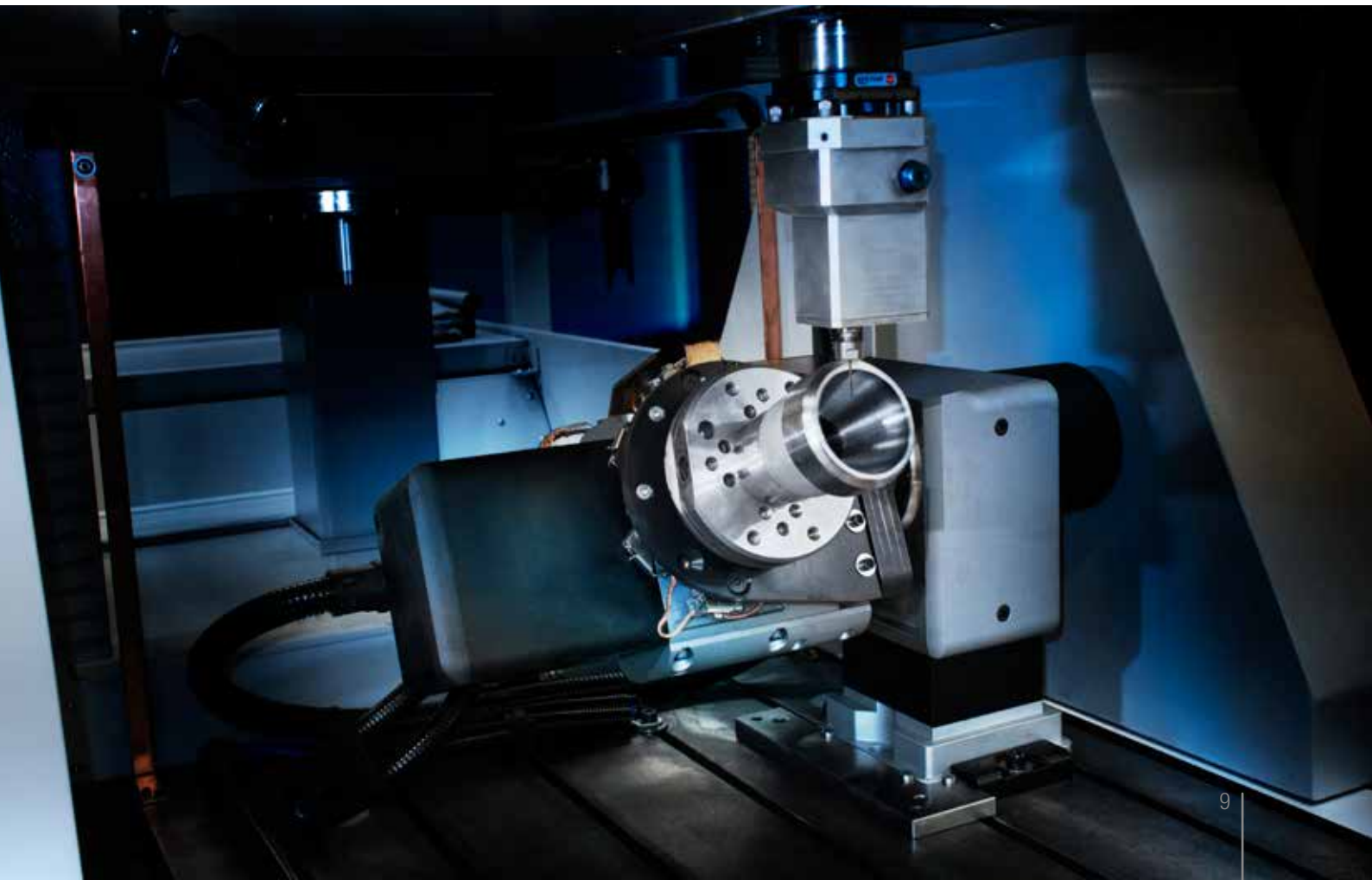
### **Intelligent measuring software**

The integration of measuring software likewise supports the setup of complex components.





**5<sup>th</sup>/6<sup>th</sup> axis as fully integrated EDM axes**  
for machining high-precision components of different sizes



# Multi-flexible automation – all from a single source

## Flexible connection of handling systems

The market is defined by requirements for shorter delivery times, diversity of production variants and constantly rising cost and competition pressure.

We offer automation solutions that will substantially reduce costs and turnaround times.

All of our machines are prepared for automation, whether as a single machine, as a cell, or line automation. OPS-INGERSOLL can supply the entire process chain, including automation, measuring machine, cleaning station and software.

### New and extremely fast

MultiChange light / performance  
with extremely reduced idle times



(Changing detailed electrodes  
in less than one minute)

## As compact as possible ...

# MultiChange light / performance

### GANTRY EAGLE 500

with MultiChange light or performance with up to  
232 electrodes and 10 workpiece pallets  
(variable configuration)



### MultiChange light / performance

The handling system is equipped with a magazine for storage of workpieces and electrodes. Available options include a mechanism for turning the electrodes, chip detection and job management functions. Connection for up to two machines is possible.

# MultiChange flexible



## MultiChange flexible

Our MultiChange flexible is the universal automation solution for up to three machines. 50 racks can be configured individually. The 6-axis robot changes pallets up to a size of 500 x 500 mm. The robot is controlled by our in-house OIPM part management system with Chipldent light, or alternatively by a fully integrated job management function.

... as big as necessary

# MultiChange linear

## MultiChange linear

Complex line automation solution for connecting multiple machines, for example with EROWA.



# G-Line, the innovative master concept in electric discharge machining

**faster, more precise  
and highly productive!**





Innovation for precision mould making

# Precision in a small footprint



## GANTRY *EAGLE* 400

Axis-travel X / Y / Z: 420 / 300 / 400 mm

Work tank W / D / H: 650 / 500 / 340 mm

- **User-friendly concept**
- **Optimal accessibility**
- **Extremely compact**

Our smallest model – the GANTRY *EAGLE* 400 – sets standards in precision mould making in response to the continuously increasing requirements of this industry. This unique product highlight offers maximum precision due to the gantry design, increased efficiency and consistent utilisation of synergy effects in HSC and EDM engineering technology.

Convincing technology

# Secure your competitive edge



## GANTRY *EAGLE* 500

Axis-travel X / Y / Z: 525 / 400 / 450 mm

Work tank W / D / H: 770 / 670 / 440 mm

- Flexible automation
- Compact
- Fast & extremely precise

Good products, consistently improved.

Our successful GANTRY design is the basis for maximum dynamics and demanding requirements with the revolutionary *EAGLE POWERTEC* technology.

The GANTRY *EAGLE* 500 fulfils stringent requirements for precision and achieves extremely good surface qualities despite complex geometries.

Innovative technology for more process reliability

# The solution for complex tasks



## GANTRY *EAGLE* 800

Axis-travel X / Y / Z: 550 / 850 / 450 mm

Work tank W / D / H: 800 / 1.100 / 480 mm

- **Top size / travel ratio**
- **Maximum dynamics**
- **Even higher precision**

The GANTRY *EAGLE* 800 is the symbiosis of a large working area and small footprint in combination with unbelievable performance – and that is a guarantee for market success. It offers decisive competitive advantages in the machining of medium and large workpieces.

Guaranteed quality and flexibility

# Optimal machine concept



## GANTRY *EAGLE* 1200

Axis-travel X / Y / Z: 1.010 / 1.510 / 700 mm

Work tank W / D / H: 1.270 / 1.770 / 680 mm

- No filling / emptying times
- Complete and partial machining
- Gantry construction

The potential of the GANTRY *EAGLE* 1200 is unique. Due to a high traversing speed and *EAGLE POWER JUMP* it remains dynamic in complex workpieces, while it is designed for efficient machining in the making of large moulds. Despite the different machining capabilities the GANTRY *EAGLE* 1200 operates with full precision at an impressive speed.



Innovation leader for large formats

# The BIGSIZE solution



## GANTRY *EAGLE* 1400 GANTRY *EAGLE* 1400plus

Axis-travel X / Y / Z:      1.250 / 2.350 / 700 mm  
   1.250 / 2.350 / 900 mm

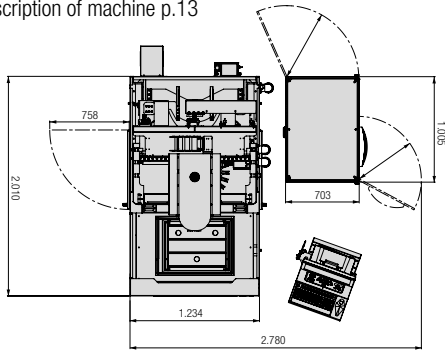
Work tank W / D / H:      1.510 / 2.590 / 790 mm  
   1.510 / 2.590 / 1.015 mm

- Top size / travel ratio
- Underground or above ground installation
- For large workpieces

In expanding the Gantry series to include the GANTRY *EAGLE* 1400 and 1400plus, we have retained the proven combination of precision and quality. To keep up with the trend of increasingly larger moulds, as in the automotive industry, the machining space of the 1400plus was increased even more in the Z direction. The GANTRY *EAGLE* 1400 is optimally equipped for delicate applications with small electrodes in large moulds or large electrodes. The *EAGLE POWERTEC* technology always ensures an electric-discharge machining process with top results.

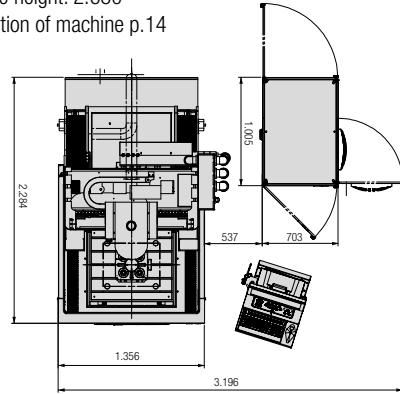
### GANTRY EAGLE 400

Machine height: 2.550  
Description of machine p.13



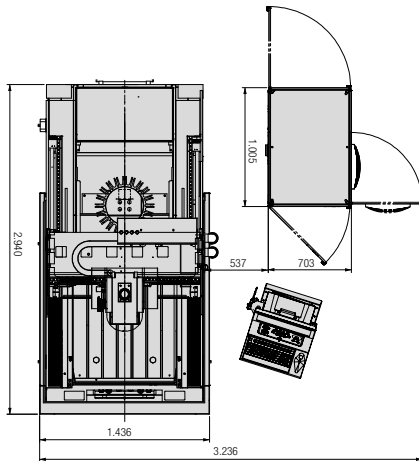
### GANTRY EAGLE 500

Machine height: 2.680  
Description of machine p.14



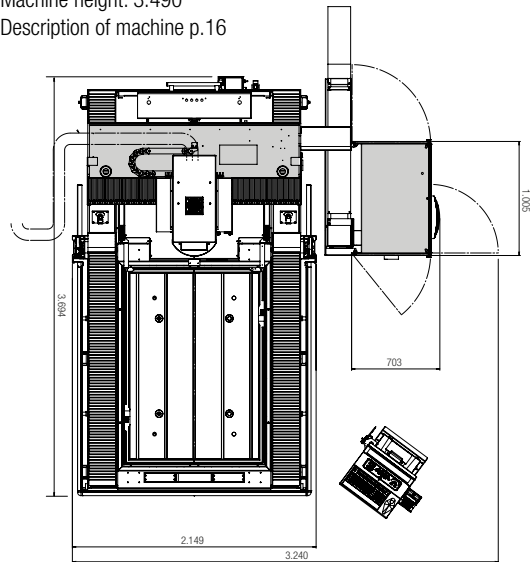
### GANTRY EAGLE 800

Machine height: 2.730  
Description of machine p.15



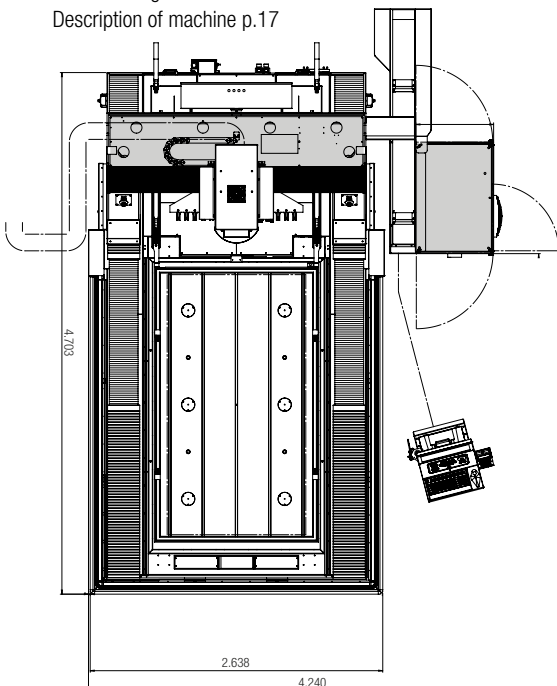
### GANTRY EAGLE 1200

Machine height: 3.490  
Description of machine p.16



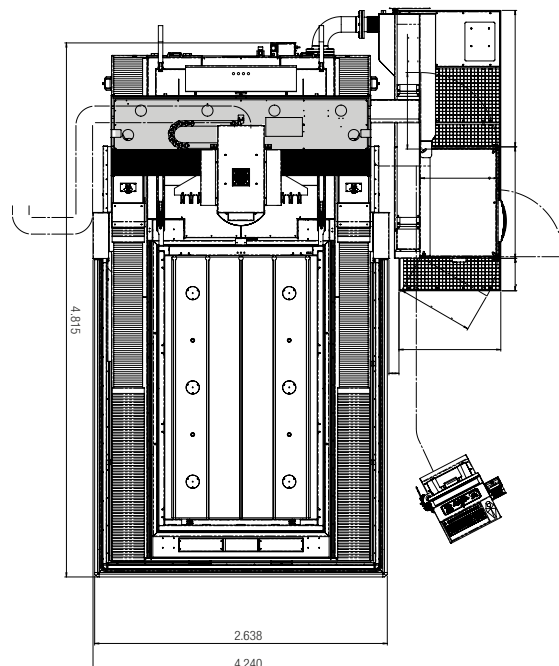
### GANTRY EAGLE 1400

Machine height: 3.950  
Description of machine p.17



### GANTRY EAGLE 1400plus

Machine height: 4.392  
Description of machine p.17



# Setup – Technical data

GANTRY EAGLE  
400

GANTRY EAGLE  
500

GANTRY EAGLE  
800

GANTRY EAGLE  
1200

GANTRY EAGLE  
1400

GANTRY EAGLE  
1400plus

## MACHINE

Machine weight	kg	4.000	4.360	6.200	12.000	21.500	21.500
Generator weight	kg	640	640	640	640	640	640
Power input	kVA	16	16	16	18	23	23
Fuse protection	A	32	32	32	32	40	40
Voltage / Frequency	V/Hz	400/50	400/50	400/50	400/50	400/50	400/50

## WORK TANK

Type		Rise and fall tank – filled movable	Rise and fall tank – filled movable	Rise and fall tank – filled movable	Rise and fall tank – filled movable	Rise and fall tank – filled movable	Rise and fall tank – filled movable
Clear dimensions (L x W x H)	mm	650 x 500 x 340	770 x 670 x 440	800 x 1.100 x 480	1.270 x 1.770 x 680 (1.140 x 1.640 x 1.040**)	1.510 x 2.590 x 790	1.510 x 2.590 x 1.015
Dielectric fluid level max. programmable/automatic	mm	300	375	450	650 (1.000**)	750	975

## WORK HEAD

Max. head load	kg	100	100	200	300	300	300
Distance electrode-clamping chuck to work table min./max.	mm	110/510*	135/585*	135/585*	100/800* (440/1.140**)	230/930*	300/1.200*

## INTEGRATED C-AXIS

RPM (adjustable)	1/min.	1-20	1 – 20	1 – 20	1 – 20	1 – 20	1 – 20
Angle positioning	degree	0.001	0.001	0.001	0.001	0.001	0.001
Load capacity for manual electrode change	kg	50*	50*	50*	50*	50*	50*
Load capacity for automatic electrode change	kg	15*	15*	15*	25*	25*	25*
Movement of inertia, max.	kg/m <sup>2</sup>	0.4*	0.4*	0.4*	0.4*	0.4*	0.4*
Torque	Nm	–	–	120	120	120	120

## WORK TABLE

Surface (L x W)	mm	550 x 470	750 x 650	760 x 1.000	1.140 x 1.640 (1.110 x 1.610**)	1.380 x 2.380	1.380 x 2.380
Load capacity (option)	kg	500	1.000	2.000	7.500	10.000 (20.000)	10.000 (20.000)

## TRAVEL WAYS

X / Y / Z inside the work tank	mm	420 x 300 x 400	525 x 400 x 450	550 x 850 x 450	1.010 x 1.510 x 700 (880 x 1.360 x 700**)	1.250 x 2.350 x 700	1.250 x 2.350 x 900
Y (by electrode changing position)	mm	580	675	1.180	1.955	2.860	2.860

## CONTROL

PC-NC-dialog		2 x 32 bit	2 x 32 bit	2 x 32 bit	2 x 32 bit	2 x 32 bit	2 x 32 bit
Type of drive		digital AC-servo-drive	digital AC-servo-drive	digital AC-servo-drive	digital AC-servo-drive	digital AC-servo-drive	digital AC-servo-drive
X, Y, Z rapid traverse	mm/min.	max. 5.000	max. 5.000	max. 5.000	max. 5.000	max. 5.000	max. 5.000
High Speed Jump Z max.	mm/min.	18.000	18.000	18.000	18.000	18.000	18.000

## DIELECTRIC SUPPLY

Filter system		Cartridge (integrated)	Cartridge (integrated)	Cartridge (integrated)	Cartridge (integrated)	Cartridge (integrated)	Cartridge (integrated)
Filter surface area	m <sup>2</sup>	16	16	32	32	32	32
Dielectric fluid, total volume	ltr.	320	400	800	2.400 (4.800**)	5.000	6.300

## ELECTRODE CHANGER

Type (option)		Pick-up rotary disc	Pick-up rotary disc	Pick-up rotary disc	Pick-up linear magazine (rotary disc)	Pick-up linear magazine (rotary disc)	Pick-up linear magazine (rotary disc)
Positions (option)		20 (30)	20 (30)	20 (30)	13 (30/48)	15 (30/48)	15 (30/48)
Combi-magazine positions optional					2/18	2/18; 4/18	2/18; 4/18
Electrode weight							
– Single electrode	kg	15*	15*	15*	25*	25*	25*
– Total weight	kg	60*	60*	60*	150* (200*)	150* (200*)	150* (200*)

## GENERATOR

Type		Adaptive current	Adaptive current	Adaptive current	Adaptive current	Adaptive current	Adaptive current
Machining power, max. (option)	A	60 (110)	60 (110)	60 (110)	60 (110)	60 (110)	60 (110)

## ADDITIONAL FEATURES

Automatic lubrication		Standard	Standard	Standard	Standard	Standard	Standard
Chiller, cooling power	kW	3.9	3.9	3.9	3.9	8.3	8.3
CO <sub>2</sub> -fire extinguisher, DIN 14497, size	kg	6	6	8	16	30	30

\* Note: The indicated values are maximum values, which may vary according to the clamping system used.  
\*\* for the GANTRY EAGLE 1200plus - Detailed machine specifications on request.

Technical modifications reserved.

G-Line provides the highest flexibility in the EDM process

## Long travel distance





### **Maximum capacity!**

This complete clamping setup for two large-format moulds works perfectly! The result: a highly profitable process with little effort.

High speed symbiosis

# A perfect match


PP1  
**ADC**  
ACTIVE DIELECTRIC COOLING



PP2  
**PGC**  
POSITION- & GEOMETRIC COMPENSATION



PP3  
**TC**  
TEMPERATURE COMPENSATION



PP4  
**IPR**  
INCREASE PRECISION & REPEATABILITY

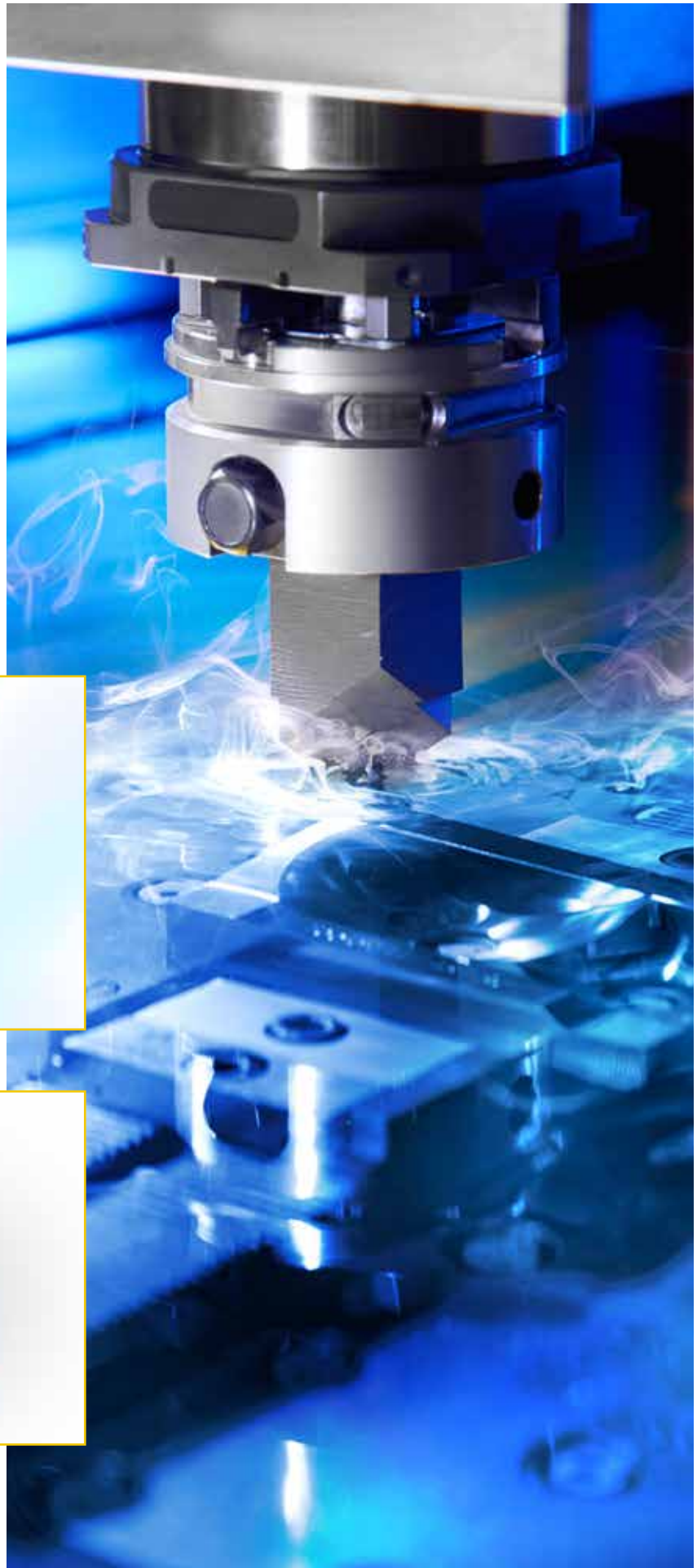


**PP**\*\*\*  
PRECISION PACKAGE



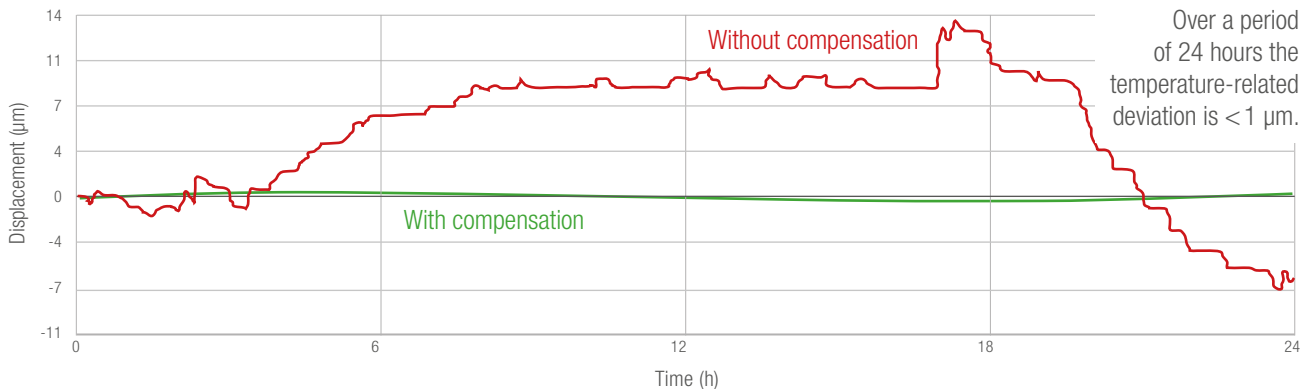
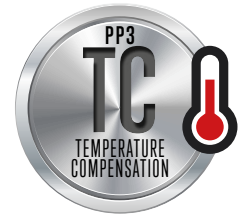
## Generator

EAGLE POWERTEC is the only generator in the world that features adaptation of the discharge spark to the constantly changing gap conditions. Every impulse generates the maximum removal rate while simultaneously causing the least amount of wear. High removal rates are achieved even in the case of undersized dimensions, with higher accuracy of reproduction. At the same time, the high quality of the process monitoring ensures optimal gap conditions despite the increased removal rate. The drastically reduced wear ensures sharp edges and accurate geometry. This saves time and electrodes and therefore reduces costs.



# Temperature compensation

The biggest enemy of precision in 24/7 automation is the occurrence of temperature deviations, which cause an one-sided shift in the coordinates. In addition to the symmetrical design of the gantry concept and the controlled cooling of all heat sources in the machine, every GANTRY EAGLE also features intelligent temperature compensation. Each machine is equipped with sensors, at relevant positions, that detect all conditions that occur in relation to the temperature change and intelligently compensate the shift to ensure high precision in every environment.



## Increased machine precision and repeat accuracy

Specially developed precision packages increase the precision and repeatable accuracy of the machine. Maximum machine precision is achieved by a dielectric and machine cooling system, geometric thermal error compensation and high precision determination of axis positioning by a laser interferometer measurement in the working environment of the machine. IPR – the guarantee for maximum precision over the entire travelling distance.





# Recessed table clamping system

The recessed table clamping system allows optimal utilisation of the machining space without limiting the automation capabilities. High workpieces with long electrodes can be used as in the past. Large mould plates can likewise be mounted on top.



# OPS-INGERSOLL C-axis

Integrated in the machining head, the high-performance C-axis is a standard feature of every OPS-INGERSOLL EDM machine. Run-out properties, potential inertia and positioning accuracy fulfil the most stringent standards placed on a C-axis in electric-discharge machining processes. Even heavy or protruding electrodes are held exactly in position. The highly dynamic direct drive allows multi-axis electric-discharge machining. All standard electrode clamping systems can be used.





# Chip ID system

The chip ID system uses RFID technology for easy and reliable identification of workpieces and electrodes. All information is saved in a database to allow transparent management of all machining processes.

Even if electrodes and workpieces are placed in a random tool changer position, they are automatically located with no need for manual intervention. This virtually eliminates errors in location.

# 20, 30 or 48 electrode changer

An especially practical feature is the internal electrode changer. Without an external automation system, it enables the automated execution of extensive high-precision machining processes with many detailed electrodes. The chip ID system can be integrated to prevent incorrect insertion and minimise manual tasks.





# RAM clamping system

Even large and heavy electrodes can be mounted on the machine head by means of a pallet system for automated changing. Electrodes can be integrated either by an internal combination electrode changer or by external automation systems.

# Integrated filter system

Integrated cartridge filter system with 16 or 32 m<sup>2</sup> filter surface area for a long service life. Filtering from inside out and having the quick-release connector at the top, keeps the dirt in the filter during clean, fast and economical filter changes.



Reduce basic energy consumption, conserve resources, save money. EcoTec does the thinking and regulation for you.

The intelligent design ensures that power is consumed only when it is actually needed.

It monitors and regulates optionally selectable warm-up programs, programmable wake-up functions, idle states after program end, and much more. Intelligently designed to reduce energy consumption to an absolute minimum!



# Service management



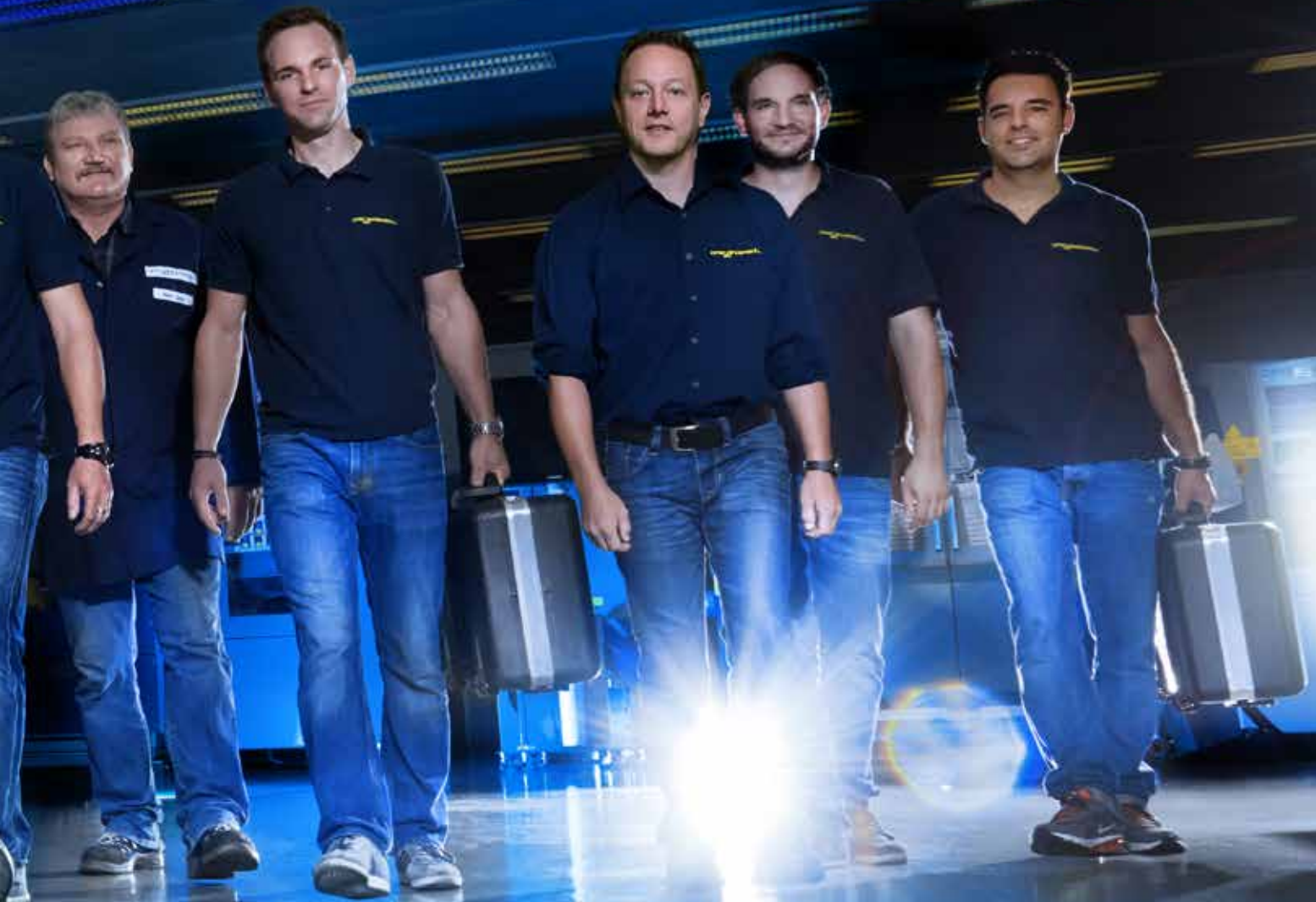
## Spare parts

A rapid and flexible supply of spare parts is of essential importance to your economic success. Thanks to our comprehensive stock of spare parts, we can react to your requirements on short notice.

## Application support

An important part of the OPS-INGERSOLL service spectrum is the know-how transfer of our application technology. Our team of experts consists of experienced tool and mould makers, who advise and support you in the implementation of your technical requirement.

# FAST DIRECT FLEXIBLE PERFECT



## Maintenance

Regular maintenance intervals reduce downtime and increase reliability and the service life of your machines.

## Training

In our training and technology centre, we have the facilities to provide you with theoretical and practical training to refine your expertise and operator skills. Benefit from the know-how of our experts!

## The Success Factory

Outstanding customer solutions are created here. This is where passionate and experienced mechanical engineering experts live. This is our home!

## Quality finale

Well thought-out, highly efficient production processes assure the high quality of all machines from design concept to delivery. This assures enthusiastic customers!





# TEAM EAGLE

League champions with  
perfect mastery of surfaces



## The **EXPERT** Principle Complete process performance

The 4 success factors for profitable  
process organisation:

- 1 EAGLE technologies
- 2 Automation solutions
- 3 Process experts
- 4 Application know-how



**OPS**  **INGERSOLL**  
Fly with the eagle!

OPS-INGERSOLL Funkenerosion GmbH • Daimlerstrasse 22 • 57299 Burbach, Germany

Telephone: +49 (0) 2736 1 446-0 • E-mail: [info@ops-ingersoll.de](mailto:info@ops-ingersoll.de)

Internet: [www.ops-ingersoll.de](http://www.ops-ingersoll.de)