MAKINO

Promise of Performance

Product Catalogue

SKÄRPVERKTYG AB

MAKINO

Carving the right solution out of a difficult problem.

Our job is manufacturing for manufacturers. All machines are produced by machine tools. Because the quality of our products is directly linked to the quality of all industries, we are required to deliver high quality and reliability. However, since neither of these two things is achievable in one day, there are certain things that we have valued since the company was founded. Namely, tackling customers' problems. The Makino brand has been built on continuously overcoming these problems, one by one, and together, improving quality and generating trust.

Promise of Performance
Makino

OVOICE

HISTORY

Makino provides added value to your manufacturing, by creating superior machine tools and developing the peripheral technologies that go with them.

Since our foundation, our stance has been not to remain satisfied with merely developing functionality.

We pursue quality above all else, with a corporate spirit that seeks to develop first-class products for worldwide use.

Through its numerous innovations, Makino has continued to develop the world's most advanced machining centres.

1937

Establishments

Founder Tsunezo Makino (left), second president Masatoshi Shimizu (right)

Makino began in 1937. Our founder, Tsunezo Makino, established the Manufacturing Division of Makino Shoten in Tokyo's Meguro Ward, as a specialized maker of vertical milling machines. The company's name was later changed to Makino Vertical Milling Machine Works, and finally to Makino Milling Machine Co., Ltd. in 1961.

1958

First NC milling machine in Japan

Makino exhibited Japan's first NC milling machine at the 3rd Osaka International Trade Fair in 1958. India was involved in its creation, with its origins dated back to two years earlier. Tsunezo Makino had participated in a business mission to India as a representative of the machine tools industry. The project began with an enthusiastic question as to whether Japan had numerically controlled machine tools or the ability to develop them. India's tendency at that time was to focus its attention exclusively on the West, and Mr. Makino promised there and then to exhibit such a machine at the Osaka International Trade Fair. This became his mission, and, working together with Control Division[1] of Fuji Telecommunications Equipment Manufacturing[2], Makino succeeded in developing a vertical milling machine which was numerically controlled by magnetic tape commands.

1 Now FANUC Corporation
2 Now Fujitsu Limited

1966

First machining centre in Japan

Leveraging the technology of the 1958 K-type tool-boring milling machine, which had been highly acclaimed by the die and mould industry, in 1966 Makino debuted the horizontal machining MCP70. This machine was capable of processing such as milling, boring, and drilling using a single machine. Japan's first machining centre with automatic tool-changing was exhibited at the 4th Osaka International Trade Fair in 1968, and certainly caught the audience's eye. It drew a large crowd as people could see at a glance that there was a tool magazine atop the machine that could switch between tools in three seconds.

1980

Developing electrical discharge machines

Electrical discharge machines were a relatively new processing technology at the time, but the die and mould makers using them wanted electrical discharge machines made by makers of machinery, rather than electrical appliance makers. In response, we developed and marketed our own die sinking and wire electrical discharge machines. Makino's meticulously built electrical discharge machines were welcomed by die and mould makers for their high rigidity and accuracy, and since then many of them have been in use at die and mould processing sites.

1999

Machining centres for die and mould

Developing the V series

Die and mould makers, then in an ongoing depression, rebuked that there were "no machines to buy from Makino". In response to this, we developed the V series die and mould machining centre in a short time and immediately began mass-market sales. We achieved shortened die and mould delivery times with high-speed, high-precision machines. The V series' strengths – compact layout, machining accuracy, machined surface quality, high-speed machining – became popular, and permeated the industry to the point that its name became synonymous with die and mould machining centres. Its DNA was passed down to the Vi series, and even now, machining centres for the die and mould industry continue to remain Makino's flagship products.

2000

Machining centres for aerospace parts

Developing the MAG series

The MAG series was created in response to customers' requests for higher efficiency machining of the wings of large aircraft. The horizontal machining centres, which use a large central axis and a high-speed feed axis, dramatically improved productivity compared with the gantry-style machining centres that had been used until then. Since we started selling it in 2000, the MAG series has been endorsed by aerospace manufacturers and their suppliers and is used at manufacturing sites throughout the world.


C-B1
C-B2
C-D1
C-D2
C-D3

COMPANY

We'll solve any problem, big or small. We pursue quality all the way.

Manufacturing sites pose their own difficult challenges and continual high-level demands. The Makino brand has become highly regarded within the industry because we are constantly pursuing quality in accuracy, speed, and user-friendliness.
We always pay close attention to our customers' requests and build machines that can contribute to their profits. Our "adaptability" in our customers' time of need and "technical capabilities" are second to none when it comes to creating machine tools like none other before.

1 An Obsession for Detail

Even an ordinary type of spindle is a precision component composed of 2,400 parts.

Our concern is whether we can manufacture the most high-precision product with stability and high productivity.

The key to this is the manufacturing environment.

We carefully select locations with solid ground on which to build our plants to avoid introducing subtle defects.

The temperature inside our plants is controlled to within ±1 degree. By performing assembly work in clean rooms, only parts that pass over 500 spindle test items are used in our products.

At Makino, we are obsessed with detail and that is why we can deliver products with reliable accuracy and durability to our customers.

2 Providing Processing Technology

Reducing the lead time of die and mould and prototype components, and high value added precision components.

The Applications Division develops new machining methods and equipment to satisfy high accuracy requirements and makes proposals to customers.

Our processing technicians are stationed in Europe, allowing us to respond quickly and closely to the needs of the local community.

They also independently evaluate new work materials and tool machining conditions and always provide the most up-to-date information.

3 Providing Support

Makino Technical Service

Makino's service engineers give their all to support that one machine that is irreplaceable to you.

From machine installation and test runs, to explaining how to operate it and each function, as well as the reinstallation and operational checks needed when a plant is relocated or the layout is changed after installation. They will also respond to defects requiring urgent attention.

Makino ensures that one machine is always able to operate at its best.

"Turnkey engineering" is an engineering service that delivers equipment in a condition in which you, the customer, only have to turn the key at the end. High-quality, high-efficiency machining can only be achieved by engineering these elements as a whole, rather than by simply gathering together individual elements such as processing machines, cutting tools, fixtures, and transport equipment. To achieve this, the sales, proposal, engineering, and design divisions work together as one with strong cooperation.

4 Automation Technology

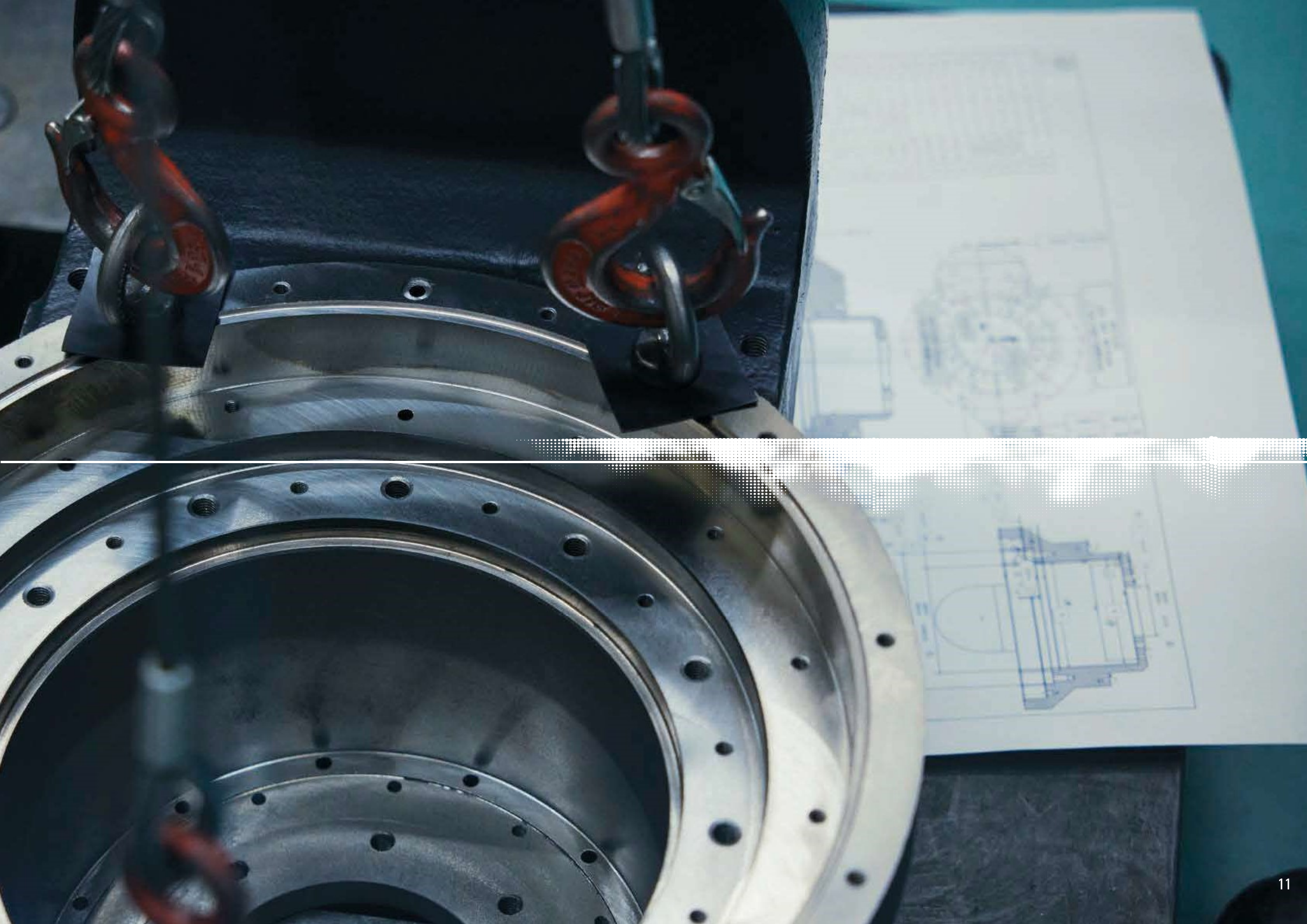
Automation provides stable productivity and improved and uniform quality as a variety of challenges, such as labour shortages due to a shrinking workforce, arise. It helps to reduce the workload a little.

Going forward, the introduction of reliable automation systems will be essential.

At Makino, we have been working on the automation of our machine tools since the 1960s.

We have a strong track record in areas such as machining centres, control systems, conveyance vehicles, robots, conveyors, and software, along with reliable technology and knowledge.

PRODUCT LINE-UP



LINE-UP 1

VERTICAL MACHINING CENTRES

Makino's vertical machining centres have evolved to meet the stringent demands of die and mould makers.

Based on a high-speed spindle with low vibration and a solid machine structure, we achieve excellent finished machining surfaces using our own technologies such as GI control and environmental temperature measures.


MAKINO V33i

LINE-UP 1

VERTICAL MACHINING CENTRES

series V

V22, V33i, V56i, V77,
V77L, V99, V99L

High-end mould and die processing machines that can handle a wide variety of moulds including plastic, press, and rubber

V series	Axis travels (X x Y x Z) (mm)	Spindle speed (rpm)	Taper hole	Max. workpiece size (W x D x H) (mm)	Machine size (W x D x H) (mm)	Max. workpiece weight (kg)
V22	320 x 280 x 300	40,000	Equivalent to #30	450 x 475 x 200	1,500 x 2,000 x 2,250	100
V33i	650 x 450 x 350	20,000/30,000/40,000	#40	750 x 635 x 250	2,245 x 3,290 x 2,400	300
V56i	900x 550 x 450	20,000/12,000/30,000		1,050 x 720 x 450	3,470 x 3,110 x 2,925	800
V77	1,200 x 700 x 650	(#40) 20,000/30,000 (#50) 12,000/18,000	#40/#50	1,400 x 700 x 550	(#40) 3,805 x 4,060 x 3,300 (#50) 3,900 x 4,060 x 3,300	2,500
V77L	1,500 x 700 x 650			1,650 x 700 x 550	4,150 x 4,060 x 3,300	2,000
V99	1,500 x 1000 x 800			1,800 x 1,000 x 650	5,140 x 4,700 x 3,500	4,000
V99L	2,000 x 1,000 x 800			2,300 x 1,000 x 650	5,650 x 4,700 x 3,500	4,000

series
iQ

iQ300, iQ500

Achieves difficult but highly versatile cutting with submicron processing accuracy and dedicated microfabrication machines

series
D

D200Z, D300, D500, D800Z

Uses a DD motor to process a wide variety of items, from dies and moulds to components, on 5 axes simultaneously on rotating axes with high followability

series
VS

V80S, V90S, V100S

With the distinctive slant structure of its spindle, the VS series specializes in finishing medium and large dies and moulds on 5 axes simultaneously

iQ series	Axis travels (X x Y x Z) (mm)	Spindle speed (rpm)	Taper hole	Max. workpiece size (W x D x H) (mm)	Machine size (W x D x H) (mm)	Max. workpiece weight (kg)
iQ300	400 x 350 x 200	45,000	Equivalent to #30	600 x 580 x 190	2,925 x 3,400 x 2,250	100
iQ500	600 x 500 x 300			755 x 500 x 300	3,165 x 3,605 x 2,470	300

D/DZ series	Axis travels (X x Y x Z) (mm)	Axis travels	Spindle speed (rpm)	Taper hole	Max. workpiece size (dia. x H) (mm)	Machine size (W x D x H) (mm)	Max. workpiece weight (kg)
D200Z	350 x 300 x250	91°/360° (B/C)	30,000	#40	300 x 210	1,868 x 3,030 x 2,300	75
D300	300 x 500 x 350	240°/360° (A/C)	15,000/20,000/30,000		450 x 270	2,860 x 2,650 x 2,500	120
D500	550 x 1,000 x 500	150°/360° (A/C)	14,000/20,000/30,000		650 x 500	3,550 x 4,500 x 3,200	350
D800Z	1,200 x 1,100 x 650	93°/360° (B/C)	(#40) 14,000/20,000 (#50) 12,000/18,000	#40 #50	1,000 x 550	3,730 x 4,990 x 3,600	1,200

VS series	Axis travels (X x Y x Z) (mm)	Axis travels	Spindle speed (rpm)	Taper hole	Max. workpiece size (W x D x H) (mm)	Machine size (W x D x H) (mm)	Max. workpiece weight (kg)
V80S	1,300 x 1,000 x 600	60°/120° (A/C)	20,000	#40	1,500 x 1,200 x 550	4,600 x 3,210 x 3,614	2,500
V90S	2,000 x 1,300 x 800				2,200 x 1,500 x 700	5,650 x 3,785 x 3,864	5,000
V100S	2,000 x 2,500 x 800				2,000 x 2,500 x 1,050	5,300 x 6,500 x 4,214	15,000

L2

A vertical machining centre for processing mass-produced components

Boasts high processing performance although the machine is compact in size

Helps keep costs down with device specifications tailored to the content processed

PS105

Advanced technology and increased capacity drive new levels of productivity for job-shop production

L2 series	Axis travels (X x Y x Z) (mm)	Axes travel	Spindle speed (rpm)	Taper hole	Max. workpiece size (dia. x H) (mm)	Machine size (W x D x H) (mm)	Max. workpiece weight (kg)
L2	300 x 200 x 200	360° (A)	16,000/8,000/20,000	Equivalent to #35/#30	230 x 363	850 x 2,315 x 2,295	60
L2 with increased strokes	400 x 300 x 300		16,000/8,000	Equivalent to #35	300 x 463	980 x 2,755 x 2,495	

PS105	Axis travels (X x Y x Z) (mm)	Spindle speed (rpm)	Taper hole	Max. workpiece size (W x D x H) (mm)	Machine size (W x D x H) (mm)	Max. workpiece weight (kg)
PS105	1,050 x 510 x 460	8,000/14,000	#40	1,300 x 510 x 460	2,800 x 3,820 x 2,555	800

series
DA

DA300, DA500

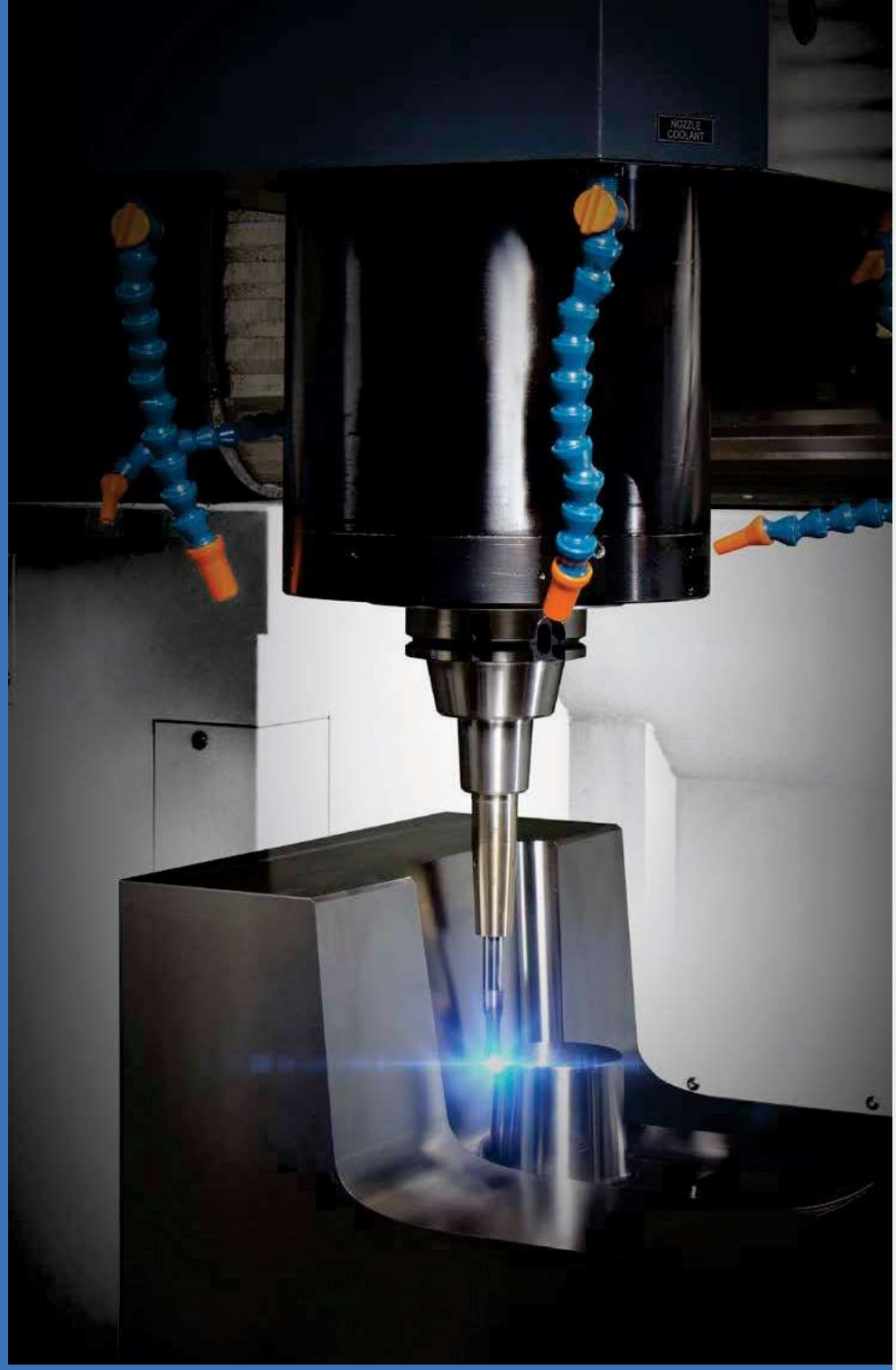
Possesses an agile spindle and feed axis, and processes components by increasing chip evacuation

D2

A large 5-axis machine that processes the shaping and structural parts of dies and moulds in a single chuck

DA series	Axis travels (X x Y x Z) (mm)	Axis travels (A/C)	Spindle speed (rpm)	Taper hole	Max. workpiece size (dia. x H) (mm)	Machine size (W x D x H) (mm)	Max. workpiece weight (kg)
DA300	450 x 620 x 500	150°/360°	20,000	#40	450 x 400	4,270 x 2,600 x 2,885	250
DA500	800 x 900 x 550				800 x 500	5,390 x 3,025 x 3,475	350

D2	Axis travels (X x Y x Z) (mm)	Axes travel (W) (mm)	Axis travels (A/B/C)	Spindle speed (rpm)	Taper hole	Max. workpiece size (dia. x H) (mm)	Machine size (W x D x H) (mm)	Max. workpiece weight (kg)
D2	2,200 x 2,300 x 1,100	700	165°/120°/ 360°	15,000	#50	2,100 x 1,750	7,835 x 8,210 x 5,500	10,000



F5

The ideal hard milling machine for complex applications

F8/F9

Designed to provide the power, speed, precision and versatility to attack both large proudction part applications as well as big die and mould components

F5	Axis travels (X x Y x Z) (mm)	Spindle speed (rpm)	Taper hole	Max. workpiece size (W x D x H) (mm)	Machine size (W x D x H) (mm)	Max. workpiece weight (kg)
F5	900 x 500 x 450	20,000	HSK-A63	1,000 x 500 x 450	2,565 x 3,145 x 3,065	1,000

F8/F9	Axis travels (X x Y x Z) (mm)	Spindle speed (rpm)	Taper hole	Max. workpiece size (W x D x H) (mm)	Machine size (W x D x H) (mm)	Max. workpiece weight (kg)
F8	1,300 x 800 x 650	10,000/20,000	#50/#40	1,550 x 800 x 550	3,850 x 4,090 x 3,540	2,500
F9	1,600 x 800 x 650			1,850 x 800 x 550	4,300 x 4,090 x 3,540	

Slim family

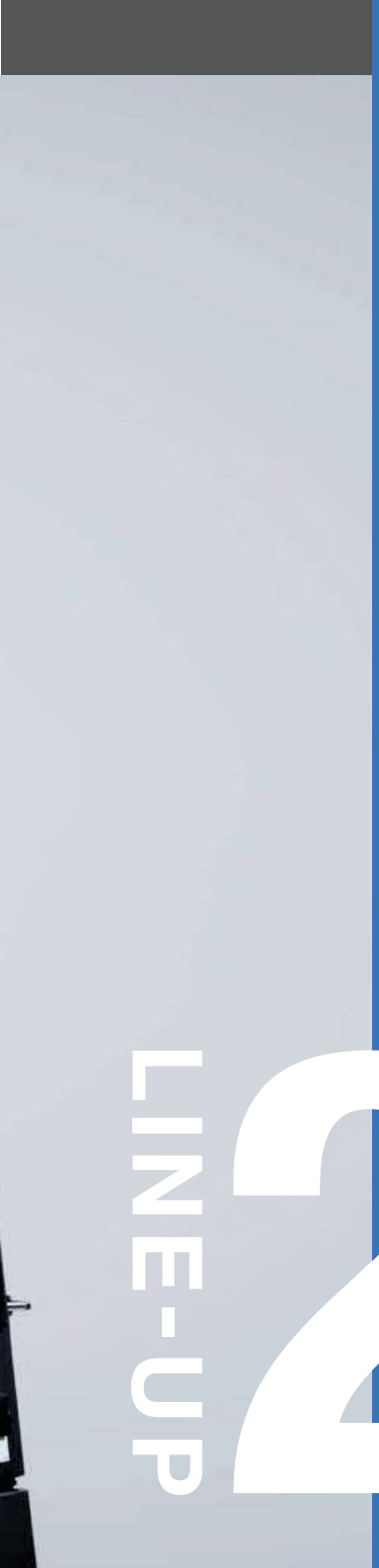
Slim3n, Slim5n, Slim3n Mill Turn

Makino's compact vertical machining centre provides high performance and extremly efficient machining for high volume part production

Slim family	Axis travels (X x Y x Z) (mm)	Spindle speed (rpm)	Taper hole	Table size (W x D) (mm)	Machine size (W x D x H) (mm)	Max. workpiece weight (kg)
Slim3n	500 x 400 x 400	16,000/8,000	HSK-A50	600 x 400	1,280 x 3,650 x 2,940	400
Slim5n	710 x 400 x 410		HSK-A50	800 x 400	1,480 x 3,650 x 2,940	600

Slim MT	Axis travels (X x Y x Z) (mm)	Spindle speed (rpm)	Taper hole	Max. workpiece size (mm)	Machine size (W x D x H) (mm)	Max. workpiece weight (kg)
Slim3n MT	500 x 400 x 400	16,000/8,000	HSK-A50	Station 1: 300 x 300 x 300 (W x D x H) Station 2: 300 x 300 (dia. x H)	1,370 x 3,850 x 2,940	Station 1: 110 (A) Station 2: 40 (C)


MAKINO
a61nx



If you perform the same process, it produces the same results (improves yield), ends just one second faster (shortens cycle time), and is hard to break (minimizes down time).

Certain things become obvious, with Makino's horizontal machining centres helping to enhance your manufacturing capabilities.

LINE-UP 2

HORIZONTAL MACHINING CENTRES

LINE-UP 2

HORIZONTAL MACHINING CENTRES

series a

a40 SE, a51nx, a61nx, a71nx, a81nx, a91nx, a92, a120nx

A line-up featuring pallet sizes from 400 to 1,000 mm
A best-selling series that always continues to evolve

a series	Axis travels (X x Y x Z) (mm)	Axes travel (B)	Spindle speed (rpm)	Pallet size (mm)	Max. workpiece size (dia. x H) (mm)	Machine size (W x D x H) (mm)	Max. workpiece weight (kg)	5-axis specifications
a40 SE	560 x 640 x 640	360°	20,000	400 x 400	630 x 900	2,773 x 4,379 x 2,548	400	–
a51nx			14,000/20,000			2,659 x 4,193 x 2,796		✓
a61nx	730 x 650 / 730 x 800			500 x 500	800 x 1000	2,910 x 4,879 x 2,923	500/700 (Option)	✓
a71nx	800 x 750 x 830		10,000		900 x 1000	3,456 x 5,095 x 3,079	1,000	–
a81nx	900 x 900 x 1020		8,000/10,000/15,000	630 x 630	1,000 x 1300	3,710 x 5,605 x 3,520	1,200/1,500	–
a91nx	1,400 x 1,200 x 1,350			800 x 800	1,450 x 1,450	5,236 x 7,724 x 3,931	2,000	–
a92	1,520 x 1,250 x 1,350		8,000/10,000	1,000 x 800	1,500 x 1,500	5,231 x 9,322 x 3,910	2,000/3,000	✓
a120nx	1,900 x 1,600 x 1,700		8,000	1,000 x 1,000 1,250 x 1,000	2,100 x 1,800	6,038 x 9,969 x 4,216	3,000/5,000	–

series

aZ

a500Z, a800Z, a900Z

Using a distinctive Z-table structure, this series improves workability with highly efficient 5-axis processing and a flat setup

aZ series	Axis travels (X x Y x Z) (mm)	Axis travels (B/C)	Spindle speed (rpm)	Pallet size (mm)	Max. workpiece size (dia. x H) (mm)	Machine size (W x D x H) (mm)	Max. workpiece weight (kg)
a500Z	730 x 750 x 500	360°/180°	14,000/20,000	500 x 500	630 x 500	2,804 x 5,933 x 2,776	400
a800Z	1,280 x 1,200 x 1,325		10,000/8,000/15,000	630 x 630	1,000 x 800	4,863 x 8,165 x 3,931	1,000
a900Z	1,400 x 1,200 x 1,265			800 x 800	1,250 x 1,000	5,338 x 8,438 x 3,931	

series
MAG

MAG1, MAG3, MAG3.EX, MAG4

The de facto standard in processing
the structural components of aircraft

series
MAG A

A6, A8, A8H, A12, A14.H, A20.H

Out of all MAG series machines, the MAG A specializes
in even larger aluminium structural components

series
MAG T

T1, T2, T4

Specializing in components made from
difficult-to-machine heat-resistant alloys

Contributes to efficient production through
a highly rigid tilted spindle

MAG series	Axis travels (X x Y x Z) (mm)	Axis travels	Spindle speed (rpm)	Pallet size (mm)	Max. workpiece size (dia. x H) (mm)	Machine size (W x D x H) (mm)	Max. workpiece weight (kg)
MAG1	1,520 x 1,100 x 1,350	210°/360° (A/B)	33,000	1000 x 800	1,500 x 1,500	5,770 x 9,450 x 3,860	1,300
MAG3	3,000 x 1,500 x 1,000	210°/360° (A/C)		3000 x 1500	3,000 x 1,500 x 750	13,000 x 8,060 x 4,040	3,000
MAG3.EX	4,000 x 1,500 x 1,000			3500 x 1500	4,000 x 1,500 x 750	14,750 x 9,580 x 4,040	
MAG4	4,000 x 2,200 x 800			3500 x 2000	4,000 x 2,000 x 700	15,345 x 9,580 x 4,165	4,000

MAG T series	Axis travels (X x Y x Z) (mm)	Axis travels	Spindle speed (rpm)	Pallet size (mm)	Max. workpiece size (mm)	Machine size (W x D x H) (mm)	Max. workpiece weight (kg)
T1	1,500 x 1,300 x 2,000	155°/360° (A/B)	12,000	1,000 x 1,000	dia. 1,500 x 1,500	6,420 x 8,210 x 4,525	3,000/5,000
T2	2,000 x 2,000 x 1,800	220°/360° (A/B)	4,000	1,000 x 1,250	dia. 1,900 x 2,000	7,350 x 10,000 x 5,605	5,000
T4	4,200 x 2,000 x 1,000			4,000 x 1,500	4,000 x 1,500 x 700	19,500 x 9,860 x 5,700	

MAG A series	Axis travels (X x Y x Z) (mm)	Travel range	Spindle speed (rpm)	Work surface size (mm)	Feedrate (mm/min)
A6	6,200 x 2,200 x 650	220°/360° (A/B)	33,000	6,000 x 2,000	65,000
A8	8,200 x 2,200 x 650			8,000 x 2,000	
A8.H	8,200 x 2,500 x 650			8,000 x 2,300	65,000 (X, Z) 55,000 (Y)
A12	12,200 x 2,200 x 650			12,000 x 2,000	65,000
A14.H	14,200 x 2,500 x 650			14,000 x 2,300	65,000 (X, Z) 55,000 (Y)
A20.H	20,200 x 2,500 x 650			20,000 x 2,300	

N2-5XA

The compact machine size and agile feed axis optimize the processing of small components

N2-5XA	Axis travels (X x Y x Z) (mm)	Axis travels	Spindle speed (rpm)	Max. workpiece size (dia. x H) (mm)	Machine size (W x D x H) (mm)	Max. workpiece weight (kg)
N2-5XA	300 x 300 x 230	160°/360° (A/B)	20,000	300 x 270	1,465 x 3,350 x 2,330	30

MCD, MCD-5XA, MCD-5XB series	Axis travels (X x Y x Z) (mm)	Axis travels	Spindle speed (rpm)	Max. workpiece size (dia. x H) (mm)	Machine size (W x D x H) (mm)	Max. workpiece weight (kg)
MCD2018	2,000 x 1,800 x 1,300	-	4,000/6,000/8,000	2,200 x 1,900	5,800 x 6,410 x 4,715	8,000
MCD1516-5XA	1,500 x 1,600 x 1,300	115°/360° (A/B)		2,000 x 1,140	6,590 x 8,960 x 4,430	2,300
MCD2016-5XA	2,000 x 1,600 x 1,300				7,430 x 9,150 x 4,430	
MCD2016-5XB	2,000 x 1,600 x 1,300	130°/450° (±225) (A/B)		Please contact your sales representative	6,550 x 10,575 x 4,410	2,000
MCD2516-5XB	2,500 x 1,600 x 1,300				8,245 x 10,730 x 4,545	

series

MCD-5XA/5XB

MCD2018 (3-axis), MCD1516-5XA, MCD2016-5XA, MCD2016-5XB, MCD2516-5XB

A machine for medium and large components with plenty of spindle variations and axis configurations

LINE-UP 3

SINKER EDM

NC Electrical Discharge Machines

NC electrical discharge machines, which are often used in finishing processes, must be very reliable.

In addition to the extraordinary stiffness of the castings in combination with a precise temperature management, Makino's NC electrical discharge machines feature the Hyper-i control system, which is easy for anyone to use.

Even inexperienced operators can use it with confidence.

Non-CE machine shown.

LINE-UP 3

SINKER EDM

NC Electrical Discharge Machines

Non-CE machine shown.

series

EDAC1/EDAF

EDAC1, EDAF2 H.E.A.T., EDAF3 H.E.A.T.

With high surface quality and narrow corner R processing available, these are the optimal high-precision machines for the for connectors, electronic components and fully automated cells for multicavities

EDAC1/EDAF series	Axis travels (X x Y x Z) (mm)	Work surface size (mm)	Tank size (W x D x H) (mm)	Machine size (W x D x H) (mm)
EDAC1	220 x 180 x 220	350 x 250	450 x 350 x 200	1,425 x 2,630 x 2,290
EDAF2 H.E.A.T	350 x 250 x 250	550 x 350	700 x 500 x 300	1,755 x 2,740 x 2,560
EDAF3 H.E.A.T	450 x 350 x 350	700 x 500	850 x 650 x 400	1,905 x 3,020 x 2,660

series
EDNC

EDNC6, EDNC8

High precision, fast Z-axis and a sturdy design allow efficient and accurate machining with medium large workpieces and light to heavy electrodes

There are many ribs in automotive and appliance dies and moulds and we have halved their processing time

Non-CE machine shown.

EDGE3i

With over 3000 EDGE machines sold worldwide, the series has been updated to incorporate the new Hyper-i control system

series
Hole Drilling Machines

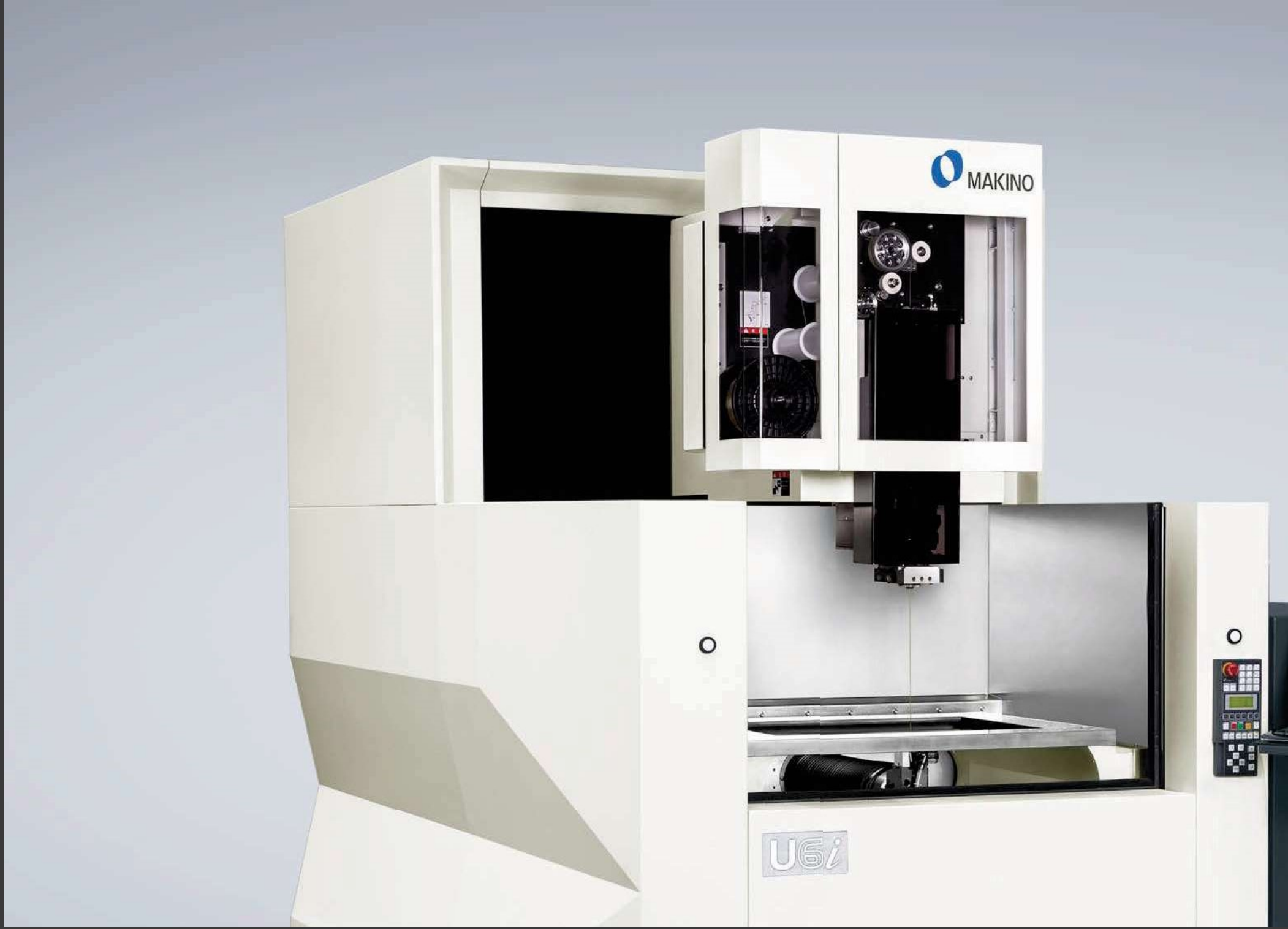
EDFH1, EDAF2-FH, EDAF3-FH, EDBV3, EDBV8, BX3

The EDFH1, EDAF2-FH and EDAF3-FH are made for precise hole drilling, the EDBV series processes turbine blade diffuser holes at high speed, and the BX3 further increases the level of automation in the processing of the diffusers

EDGEi series	Axis travels (X x Y x Z) (mm)	Work surface size (mm)	Tank size (W x D x H) (mm)	Machine size (W x D x H) (mm)
EDGE3i	450 x 300 x 320	600 x 450	800 x 550 x 350	1,950 x 2,115 x 2,330

EDNC series	Axis travels (X x Y x Z) (mm)	Work surface size (mm)	Tank size (W x D x H) (mm)	Machine size (W x D x H) (mm)
EDNC6	650 x 450 x 500	800 x 550	1,100 x 750 x 450	2,965 x 2,705 x 3,110
EDNC8	800 x 500 x 500	1,100 x 700	1,400 x 900 x 500	3,035 x 3,200 x 3,240

Hole Drilling Machines series	Axis travels (X x Y x Z) (mm)	Axes travel (W) (mm)	Work surface size (mm)	Machine size (W x D x H) (mm)	Max. workpiece weight (kg)
EDFH1	220 x 180 x 300	220	350 x 250	1,710 x 2,535 x 2,375	50
EDAF2-FH	350 x 250 x 250	250	550 x 350	1,755 x 2,740 x 2,560	500
EDAF3-FH	450 x 350 x 350		700 x 500	1,905 x 3,020 x 2,660	800
EDBV3	370 x 270 x 500	380/360°/140°(A/B)	–	1,760 x 2,500 x 2,450	5
EDBV8	800 x 600 x 500	500/360°/140°	–	2,470 x 3,680 x 2,800	50
BX3	370 x 270 x 750	450/360°/280°(A/B)	–	1,750 x 3,440 x 3,000	20


MAKINO
U6i

LINE-UP

4 WIRE EDM

Makino offers machines for the whole range of parts, from 3,000 kg and 500 mm cutting height down to micro-machining solutions with thinnest wires.

The H.E.A.T. technology provides best cutting speeds and results even at difficult flushing situations and reduces the running costs significantly.

LINE-UP 4

WIRE EDM

series U

U3, U3 H.E.A.T.,
U6 H.E.A.T., U6 H.E.A.T. Extrem

Uses H.E.A.T. to enable high-speed processing with low running costs

series Ui

U3i, U6i

The Makino Ui series will provide an universal approach to a wide range of premium applications to address the most demanding needs of precision stamping, job shop and medical industries

U series	Axis travels (X x Y x Z) (mm)	Axis travels (U x V) (mm)	Max. workpiece size (W x D x H) (mm)	Max. workpiece weight (kg)	Wire electrode diameter (mm)	Machine size (X x Y x Z) (mm)
U3	370 x 270 x 220	±50 x ±50	770 x 590 x 200	600	0.1, 0.15, 0.2, 0.25, 0.3	2,161 x 3,432 x 2,120
U3 H.E.A.T.	370 x 270 x 220	±50 x ±50	770 x 590 x 200	600		2,161 x 3,432 x 2,120
U6 H.E.A.T.	650 x 450 x 420	±75 x ±75	1,000 x 800 x 400	1,500	0.02–0.1	2,383 x 3,548 x 2,350
U6 H.E.A.T. Extreme					0.1, 0.15, 0.2, 0.25, 0.3, 0.4	2,383 x 3,548 x 2,350

Ui series	Axis travels (X x Y x Z) (mm)	Axis travels (U x V) (mm)	Max. workpiece size (W x D x H) (mm)	Max. workpiece weight (kg)	Wire electrode diameter (mm)	Machine size (X x Y x Z) (mm)
U3i	370 x 270 x 220	±50 x ±50	770 x 590 x 200	600	0.07, 0.1, 0.15, 0.2, 0.25, 0.3	1,981 x 2,653 x 2,116
U6i	650 x 450 x 420	±75 x ±75	1,000 x 800 x 400	1,500		2,273 x 3,308 x 2,350

series

Uj

U32j, U53j

These high precision machines are made for best accuracy, finest surface and perfect straightness at the part.
They are perfect for all active parts in the high quality stamping business

Non-CE machine shown.

U86

With a cutting height of up to 500 mm, this machine extends the unreached straightness of the GS-Cut technology. The pitch and form accuracy of the U86 is outstanding in the field of large wire EDM

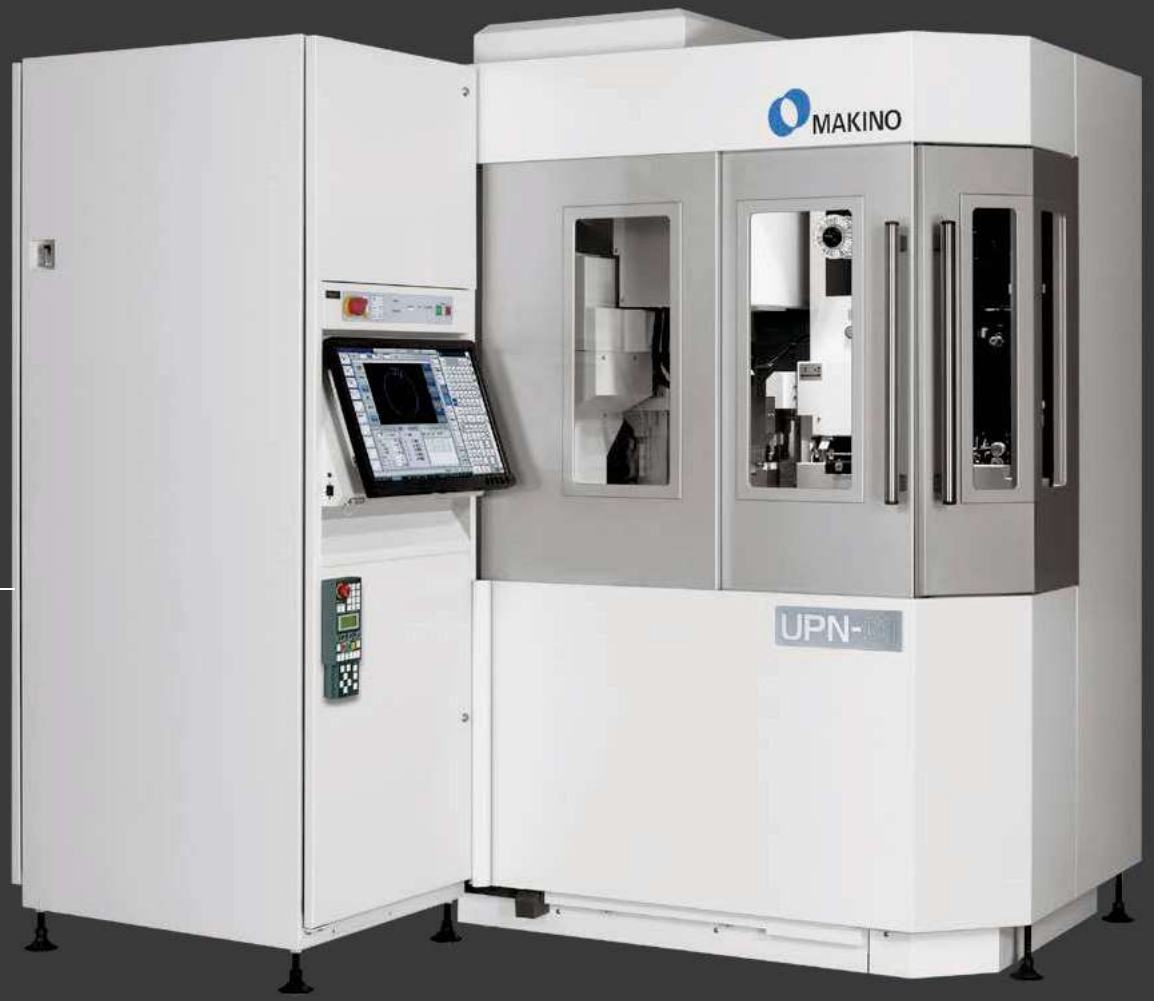
Non-CE machine shown.

Uj series	Axis travels (X x Y x Z) (mm)	Axis travels (U x V) (mm)	Max. workpiece size (W x D x H) (mm)	Max. workpiece weight (kg)	Wire electrode diameter (mm)	Machine size (X x Y x Z) (mm)
U32j	370 x 270 x 220	±50 x ±50	780 x 590 x 200	600	0.07, 0.10, 0.15, 0.20, 0.25, 0.30	1,855 x 2,735 x 2,050
U53j	550 x 370 x 220		960 x 690 x 200	1,500		2,160 x 2,845 x 2,100

U86	Axis travels (X x Y x Z) (mm)	Axis travels (U x V) (mm)	Max. workpiece size (W x D x H) (mm)	Max. workpiece weight (kg)	Wire electrode diameter (mm)	Machine size (X x Y x Z) (mm)
U86	800 x 600 x 520	±101 x ±101	1,220 x 910 x 500	3,000	0.20, 0.25, 0.30	2,940 x 3,885 x 2,785

UPN-01

This unique horizontal wire EDM allows micro machining in the highest possible accuracy. The integrated workpiece changer enables the full automation of smallest parts. With its very reliable air stream wire threading down to dia. 0.02 mm, it is the perfect solution for the watch industry



UPN-01	Axis travels (X x Y x Z) (mm)	Axis travels (U x V) (mm)	Workpiece size (W x D x H) (mm)	Max. workpiece weight (kg)	Fluid	Wire electrode diameter (mm)	Machine size (X x Y x Z) (mm)
UPN-01	160 x 160 x 50	±7 x ±7	150 x 150 x 40	8	Oil	0.02–0.10	2,130 x 2,440 x 2,100


Promise of Performance

LINE-UP **5** OTHERS

Makino is not fixated on cutting and electrical discharge machines.

We proactively work on and offer whatever we think is necessary to efficiently advance production, including lasers, CAD/CAM, mobile robots, and tools.

CAM/Software

EDCAM

This CAM system for sinker EDM is greatly reducing the programming and setup time with its direct 3D-interface to many CAD- and job management systems for fully automated EDM cells

Operational Software

MAS-A5

A software which manages and optimizes cell operations by managing NC programs, monitoring tool life, scheduling work, and can be integrated with tool presetters and Collision Safe Guard

MPmax

Information management software that makes the status of a plant's equipment and machines collectively visible and helps to optimize use of the machines and reduce downtime

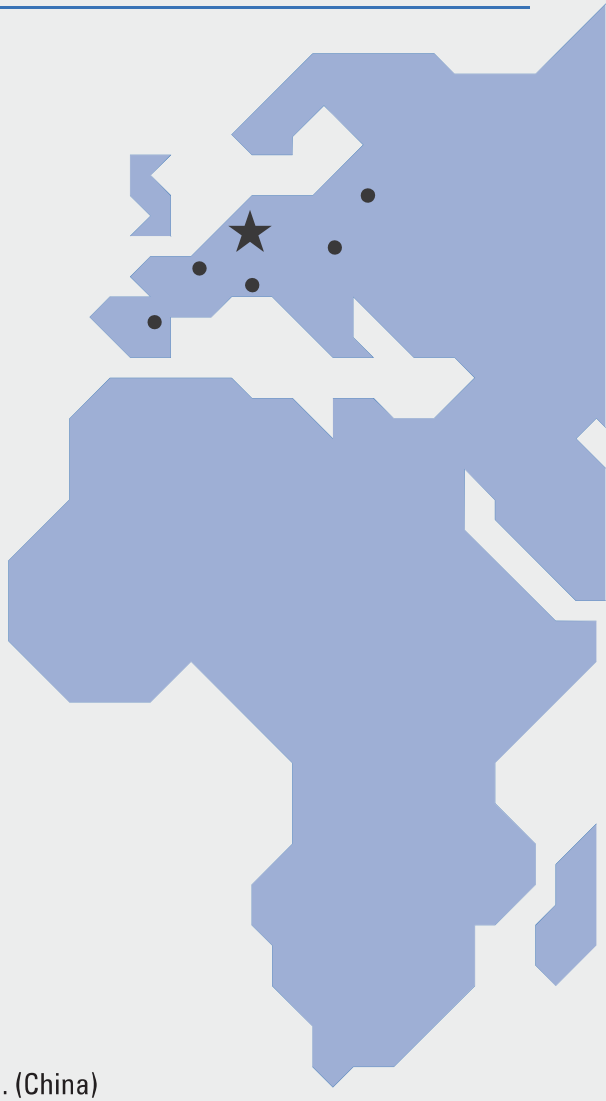
Automation Systems

iAssist, PZ1, PZ2, MMC2, µMMC

A complete range of peripheral equipment, including conveyance vehicles, robots, and operational software, promote automation at a high level

We help the world's manufacturers transform their businesses.

Our Locations



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Makino Vietnam Co., Ltd. (Vietnam)
MAKINO PHILIPPINES INC. (Philippines)

JAPAN

Makino Milling Machine Co., Ltd.

NORTH, CENTRAL, SOUTH AMERICA

Makino Inc. (USA)

Makino Mexico (Mexico)

Makino do Brasil Ltda. (Brazil)

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