AMADA GRINDER LINE UP

Grinding

研削

AMADA®

The Grinder to support customers

Since 1941 when AMADA commenced the production of profile grinders, it has been pursuing precision and quality. AMADA accessed the needs of the day and responded by providing higher productivity and greater efficiency. Providing digitalization and automation technologies, AMADA is leading today's manufacturers to a brighter future.

- **Toki Works**
  The heart of the grinder business with activities ranging from development and manufacturing, to sales and service. Maintaining harmony with the environment while providing world class quality solutions within Japan and globally.
- **Solution of the issues through customer collaboration**
  Machine development is directly effected by collaboration between our designers and our customer –partners sharing information, new technologies, and process know-how.
- **Manufacturing systems**
  Unique "booth stand" and "modular" production method drives great production efficiency and dramatic reduction of lead time. Additionally, with enhanced temperature control and vibration reduction measures, the highest quality product is produced naturally.
- **Technical Center**
  The Technical Center is where AMADA can propose to our customers solutions they need today. Here we can demonstrate how our superior grinding know-how would best suit our customer's work.
- **After service systems**
  To enable customers to use their machines with confidence, a thorough service system is established supported by service centers both domestic and overseas.
  Consumables & spare parts have centralized control at the AMADA Parts Center (in Fujinomiya). This is a system for quick & proper delivery.

Modular production

Booth-stand production

Manufacturing

Toki Works

Development Conference

Developmen

manufacturing

Toki Technical Center

Verification

Sales

RINDER

Service

AMADA Parts Center, Centrally organized for consistent part supply

A shift from surface precision to "
In quest for a much higher level o

Dynamic balance of machines supports high reciprocation grinding

AMADA, the manufacturer that pioneered high reciprocation grinding, has succeeded in achieving a new balance between grinding machine and grinding wheel. With this technology, AMADA can now master even the toughest grinding conditions.

Mirror quality "surface countenance" beyond numerical representation

High quality ground surface finishes cannot be represented by Rz alone. AMADA grinders uniquely provides flawless, mirror surface finishes and unmatched edge quality.

It is AMADA's flawless, sharp-edged mirror surface grinding that can achieve such high quality surface finish.

Meeting a broad variety of needs including both 2D and 3D geometries

A full line-up that covers a broad range of grinding requirements from mirror grinding to heavy-duty grinding, or from surface grinding to profile grinding.

Exquisite craftsmanship incorporated into software

AMADA's outstanding grinding technologies are expanded through our original software, which is installed on all our models. It will revolutionize your precision grinding department.

AMADA's unique on-board measurement technology

A CCD camera-aided image measurement system which AMADA has developed permits automatic measurement of shape precision. Automating a series of operations from tolerance validation to auto-edit grinding. This is the dawn of a new grinding concept shifted from analog to digital, from manual to unmanned profile correction.

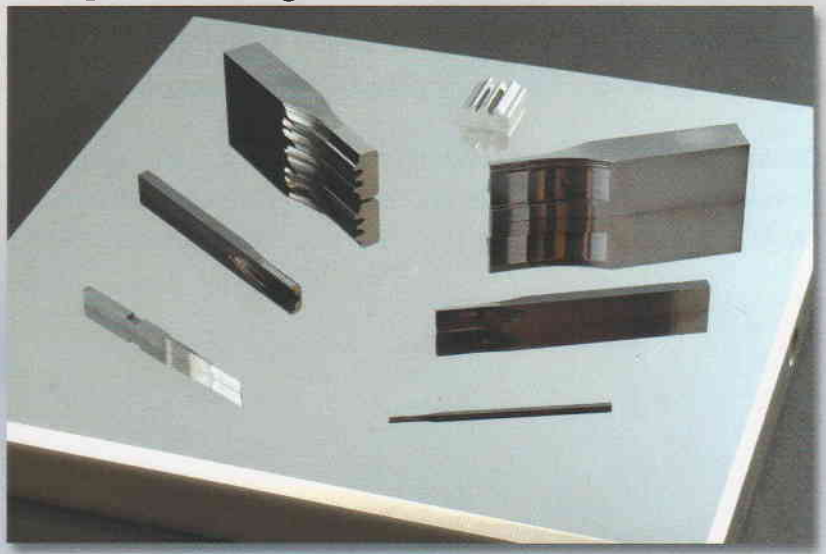
From surface grinding and forming to profile grinding Network-based total grinding system

AMADA has developed a proprietary network based programming and operating system. All grinders and programmer now work as one unit improving all aspects of the grinding process.

250 min^{-1} high reciprocation grinding

* "Surface countenance" refers to the subtle gloss and hand feel of a ground surface that cannot be represented by numerical measurements.

urface countenance”*.
ground surface quality



Refined, elegant shape

Original software that reproduces veteran craftsmanship by simple procedures

Swivel rotary dresser designed to suit high precision forming

On-board measurement system that permits significant savings in work change time

Grinder process solutions

AMADA GRINDER LINE UP

The fine feeling in the hands of skilled craftsmen is now digitalized.
Quality that only a fully diversified grinder manufacturer can achieve.

Constant quality production that provides good, ultra-micro surface texture.
Development of a full scope of peripheral devices, software, and grinding techniques.
AMADA offers the grinding solutions that manufacturers need today.

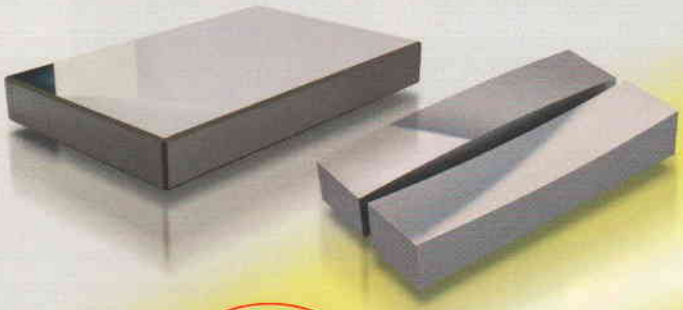
WINSTAR SERIES
P12

DV1
P 8

MEISTER SERIES
P13

GIS SERIES
P10

TFM1
P13



Rotary

SSR5

P16

Surface grinding

TECHSTER SERIES

P14

Software

Original software

P17

CAM

P18

Optional devices

On-board measurement system
Dresser

P19

Profile grinder

DV1 Graphical profile grinder

Evolution from optical to graphical

Compact, chartless, and fully automatic third-generation digital video profile grinder

❶From analog to digital

AMADA has developed the technology for automatically inspecting the finished profile and auto-correcting the program. Automatic image measurement using a CCD camera automatically controls shape precision, (previously dependent on operators) and fully automates high quality precision grinding. The outcome is consistent, unattended quality.

❷Grinding ultra-fine and micro shapes easily

A high magnification of 350x in image processing ensures that materials are ground into ultra-fine shapes, difficult with only a projector.

❸High precision, superior surface finish grinding

The image measurement system measures the shape of both the work and wheel, which provides high precision grinding of ±1 μm. A wet working feature (optional) produces a high surface smoothness finish.

❹5-axis or 7-axis type available

Two models have been developed, the 5-axis control produces unmatched surface finishes, and the 7-axis control provides automated multi-function operation with superior grinding performance.

❺Robot specifications (optional) further improves productivity

The articulated robot automatically replaces works and wheels. This makes possible continuous automatic operation for hours under the optimum conditions that best suit work materials and types of grinding, and increases the machine availability more than otherwise, leading to drastic increase in production efficiency.

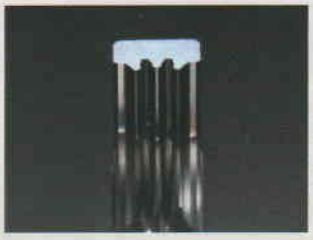
Optional full automation available

Unattended operation is achieved through automated work piece exchange utilyzing articulated robots with work piece and wheel stockers.

AWC

ATC

Robot specifications (optional)



Carbide punch

Micro punch

Automatic measurement with a CCD camera

High precision image measurement

Model		DV-1 5-axis control	DV-1 7-axis control
Wheel head stroke length	mm	0～80	0～80
Stroking rate	min^{-1}	30～400	30～200
Front/side relief angle	°	-1 to 2/±3 (manual)	-1 to 15/±8 (automatic)
Wheel speed	min^{-1}	2000～20000	600～6000
Wheel size (OD × width × ID)	mm	φ65～100×4～6×φ22.23	φ120～180×3～10×φ31.75

DV1 Original software

SOFTWARE

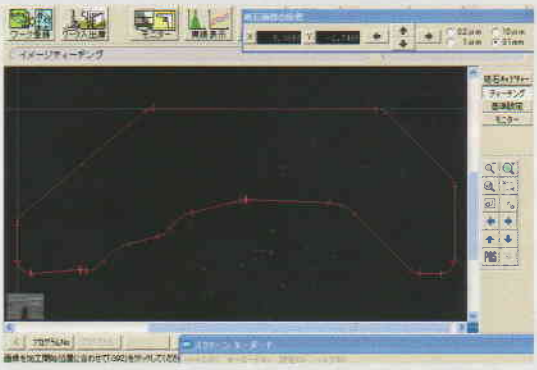
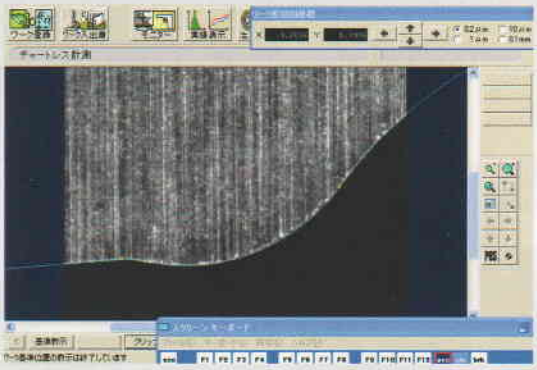


Image-based teach & playback

Image-based teach & playback software can create programs visually using monitor image of digital profile providing digital accuracy instead of projector and chart methods. Additionally, digital profile enables measurement of the workpiece profile automatically. By measuring the CCD camera image of the workpiece against the actual digital image.
Image teaching provides actual wheel based profile by capturing digital image of wheel profile. Then the wheel image is used to "teach" the wheel path against the digital workpiece profile. Actual teaching is done by manipulating the handle.



Chartless measurement

CAD data (DXF) is loaded, and based on the processing datums, the position of the work piece image is set.
When the manual handle is turned, the work piece image moves. Similarly, by moving the cursor on the NC screen the workpiece image moves, and the software can determine the error.

Automatic workpiece form measurement/compensation processing software

After grind operation is finished, the standard position is confirmed, and measurement is made with deviation from the standard. This is done automatically. No operator intervention or programming is required.
At the time of measurement, multiple points are simultaneously inspected and large divations from the standard are disregarded. The measured image area is as small as a 0.5mm. In order to measure less than 1μm, the number of pixels and dots is set.

Grinding wheel position and shape measurement

The on board dresser unit re-trues leading edge radius of the grinding wheel. The shape of the grinding wheel is plunged into the dummy work piece fixtured to the table. Through the dummy, the profile of grindstone radius is measured at multiple points, and deterined by CCM calculations. Measuring at points minimizes error. The procedure automatically qualifies both the wheel radius and wheel position greatly facilitating the set up process.

GLS SERIES Optical profile grinder

Profile grinder

Proven track record of 70 years experience

Advanced profile grinding that achieves "optical" surface smoothness

GLS-80PL

GLS-150GL

❶Bright LED for the projector's light source can improve usability

High luminance LED is utilized as a light source for the projector. Shape edges allow you to easily discern errors. The use of LED reduces running cost as well.

❷High precision and high rigidity

The incorporated high precision, high resolution optical scale allows ultra-high precision production. High rigidity and a stable well-balanced 3D enhanced design, meets all requirements for high reciprocation grinding at 600 min^{-1}

The newly designed base optimizes the placement of ribs and location of jack bolts. As a result, central deflection is removed, achieving high static precision.

Thermally controlled base and projector through by a ±0.1°C-controlled inverter oil cooler is provided as a standard specification.

❸Optical surface smoothness achieved

Spindles are high speed, high precision, and low-heat generating. Particularly high speed spindles are essential to achieve one rank-higher "optical" surface smoothness.

❹Improved productivity

The production feed rate has improved: 1500 mm/min maximum feed rate and 300 mm/min for table vertical movement. This increases working efficiency. In addition, the machine is given an automatic work change feature enabled with on-board teach software.

❺We offer 2 models to address the user's applications

Two types of profile grinders are available. GLS-80PL is specialized for mold parts with fine surface finish by high speed spindle and the reciprocation table with a low center of gravity . GLS-150GL supports a wide variety of processing ranges by long reciprocation stroke and big relief angle, and it can be used wet grinding system (optional).

Ultra-high precision die punch

Turning tool

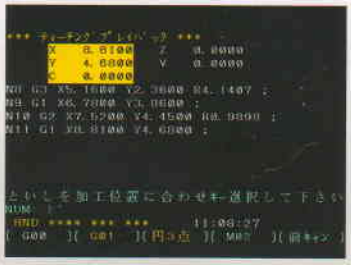
Wheel spindle stock lift (GLS-80PL)

Wheel spindle stock lift (GLS-150GL)

Model		GLS-80PL	GLS-150GL
NC control axis		4-axis(simultaneously 2-axis)	
Wheel head stroke length	mm	0～80	0～155
Stroking rate	min-1	30～600	30～400
Front/side relief angle	°	-1 ～ +3/±2	-2～20 / ±15
Wheel speed	min-1	2000～20000	2000 ～ 20000 (1000 ～ 6000:OP)
Wheel size (OD × width × ID)	mm	φ65～100×4～6×φ22.23	φ120～180×3～10×φ31.75

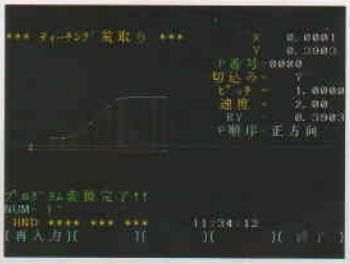
GLS SERIES Original software

SOFTWARE



Teaching playback

A working program is created from a 20X or 50X plot chart of part profile. The wheel itself is used to quickly and easily trace and teach the intersection and tangent points and a G-code program is automatically created. There is no need for complicated calculation and programming in an NC language.



Teaching roughing

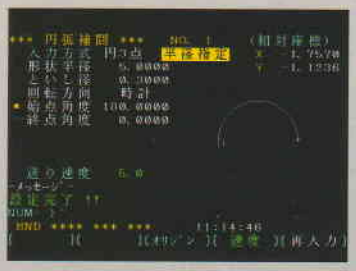
This is a feature to automatically create a roughing program, carrying out necessary calculations, from the programmed shape taught at teaching playback. The plunge direction is conversationally choosen: Y for flange cuts and X for traverse cuts.

Displaying reciprocation stroke length

Displays position where the reciprocation movement is reversed and displays stroke length. This allows you to adjust with a high precision the straight length of a shoulder or blind punch.
(GLS-80PL only)

Taper interpolation

Angular or taper grinding is possible turning only one handle. Eight angles can be stored. There is a function for measuring existing angles by teaching two points. Not only handle feed but automatic feed is also available. This is useful for forming a wheel angle and manual working of a taper.



Arc interpolation

Teach three points on an arc on the original drawing, the machine will automatically calculate the center, radius, and turning direction. Then the operator can manually work round portions just with the aid of the X-axis feed handle. Automatic feed is also available and is useful for working roundness at a single location for which a program does not have to be created anew.

On-board radius forming dresser for diamond wheels

This automatically re-trues the radius of the V-face tip of diamond and CBN wheels on machine. By touching three points on the dressing wheel the software automatically creates a circular wheel path that re-trues the diamond or CBN wheel.

Ultra-high precision die punch

Turning tool

Wheel spindle stock lift (GLS-80PL)

Wheel spindle stock lift (GLS-150GL)

Model		GLS-80PL	GLS-150GL
NC control axis		4-axis(simultaneously 2-axis)	
Wheel head stroke length	mm	0～80	0～155
Stroking rate	min-1	30～600	30～400
Front/side relief angle	°	-1 ～ +3/±2	-2～20 / ±15
Wheel speed	min-1	2000～20000	2000 ～ 20000 (1000 ～ 6000:OP)
Wheel size (OD × width × ID)	mm	φ65～100×4～6×φ22.23	φ120～180×3～10×φ31.75

GLS SERIES Original software

SOFTWARE

Teaching playback

A working program is created from a 20X or 50X plot chart of part profile. The wheel itself is used to quickly and easily trace and teach the intersection and tangent points and a G-code program is automatically created. There is no need for complicated calculation and programming in an NC language.

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Forming grinder

WINSTAR SERIES Ultra-high precision forming grinder

Forming grinder

The King of Forming Grinder

High end model capable of ultra-high precision forming grinding

WINSTAR-SP

❶The C-construction stand-alone column type unique to AMADA

The newly introduced T-shape bed and long slide column base makes it possible to provide superior workability with maintaining high straightness precision.

❷Hybrid guide surface

A hybrid guide surface, which provides at once the tracking capability of 0.1 μm and good vibration dampening characteristics is fitted on the top and bottom and front and rear slideways. A 0.05 μm resolution scale comes with the machine as a standard device.

❸No overhang V-V table slideway

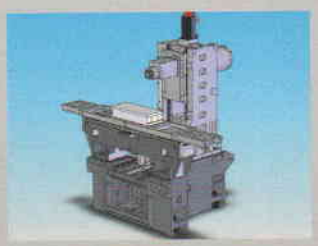
Longitudinal straightness precision is maintained over a long period of time with the aid of the fully supported V-V table slideway. High reciprocation is achieved by hydraulic pressure servo valve feedback control, the pulse handle increases operability, and this model has a teaching function as a standard feature

❹Ultra-low vibration oil-cooled spindle motor

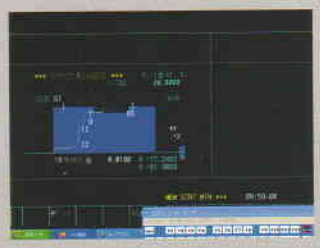
For the wheel spindles, AMADA's own ultra-low vibration oil-cooled spindle motor that enables mirror grinding is used. In addition, oil bath cooling is a standard feature. These inhibit thermal displacement.

Resin forming die

Stepped grinding



Three-face stand-alone column design



Original software

Model		WINSTAR-SP	WINSTAR
NC control axis		Simultaneous 2-axis + traverse 1 axis	
Max. chuck size (length × width × height)	mm	500×200×100	600×300×100
Travel (traverse/cross/vertical)	mm	250/600/400	340/780/450
Wheel size (OD × width × ID)	mm	φ205×6.4～25×φ31.75	φ255×6.4～25×φ50.8

MEISTER SERIES — High precision forming grinder — Forming grinder

The best seller brand of NC forming grinders

Saddle type forming grinder that pursues productivity

❶High speed table reciprocation

The AMADA-unique positioning scale and servo system provide a high reversal precision of 250 min^{-1}, which greatly improves working efficiency.

MEISTER-G3

Model		MEISTER-G3	MEISTER-V3
NC control axis		Simultaneous 2-axis + traverse 1 axis	
Max. chuck size (length × width × height)	mm	500×200×100	450×150×100
Travel (traverse/cross/vertical)	mm	250/600/400	200/500/400
Wheel size (OD × width × ID)	mm	ϕ205×6.4～25×ϕ31.75	ϕ205×15×ϕ31.75

TFM1 General-purpose forming grinder — Forming grinder

Handy and easy to be familiarized

General-purpose long seller machine

❶Exact depth of cut performance

Correct cut depth by the vertical axis pulse handle is possible.

Model		TF-M1
NC control axis		1 axis
Max. chuck size (length × width × height)	mm	450×150×70
Travel (traverse/cross/vertical)	mm	200/500/500
Wheel size (OD × width × ID)	mm	ϕ205×6.4～15×ϕ31.75

Surface grinder

TECHSTER 104/106/126 Medium-duty precision surface grinder

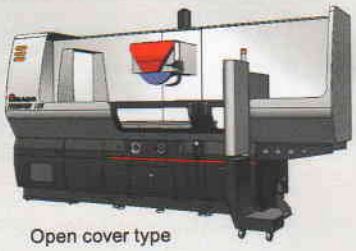
Surface grinder

High precision, long unattended accuracy

Also applicable to heavy duty grinding

TECHSTER-126


Half cover type


Open cover type

❶AMADA's own low-center of gravity frame design, makes possible high precision grinding

The high rigidity T-shape integral bed and C-shape column design and the wide base casting for full table stroke support combined to provide high straightness precision.

❷Non-hydraulic, low-environmental load ecological machine

The fully supported V-V sliding surface table has a ball screw drive system. This design provides both smooth reciprocation grinding and low powered creep feed grinding as well as crown grinding. The elimination of hydraulic fluid keeps environmental impact low.

❸Enclosure Design that provides both operability and safety

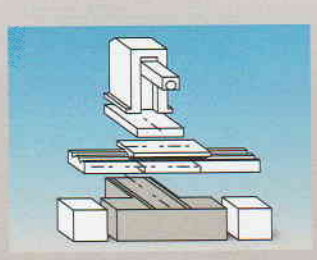
The PC-based (network compatible) NC operation panel is integrated and has a newly designed programming system. For the enclosure the user can choose from three types: the full cover which emphasizes environment friendliness; the open cover which provides open access; and the half cover which allows both environmental friendliness and operator access. Simplified programming and the right choice of a cover ensures high operability and safety at the same time maintaining high grinding efficiency.

❹Dressing

NC swivel rotary dresser provides unmatched form consistency & control, enhancing a broad range of dressers (optional).


Mirror grinding


Unequal depth groove grinding


T-shape integral bed

Linked dialog programming software

Model		TECHSTER-104	TECHSTER-106	TECHSTER-126
Type		TS-104	TS-106	TS-126
NC control axis	mm	Simultaneous 2-axis + traverse 1 axis		
Standard chuck size (L × W × H)	mm	1000×400×100	1000×600×100	1200×600×100
Travel (traverse/cross/vertical)	mm	1200/460	1300/660	1500/660
Driving system	Vertical	Ball screw drive and direct drive		
	Traverse	Ball screw drive and direct drive		
	Cross	Ball screw drive and direct drive		
Wheel size (OD × width × ID)	mm	φ355×38 ~ 50×φ127	φ405×38 ~ 50×φ127	φ510×38 ~ 50×φ127

TECHSTER 52/64/84 High precision forming surface grinder

Surface grinder

Easy operation to handle a wide range of processing

Small-size series with high rigidity and high workability

TECHSTER-84 Full cover type

TECHSTER-84 Open cover type

❶C-shaped column structure

Integrated T-shaped bed structure features high rigidity and low center of gravity and V-V slideway enable high straightness accuracy.

* Except TECHSTER-52

❷space saving design

Minimum floor space in the class by the unique cover.

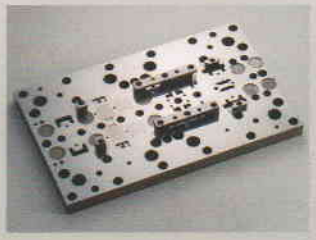
❸High operability

The proprietary column structure improves the table accessibility. The operability of works including the work loading/unloading operation is considerably improved.

❹Environment-friendly non-hydraulic ECO machines

New designed overhangless V-V sliding surface table by driving with a ball screw, high accuracy is enabled at high speed and low-speed. This non-hydraulic drive enables low noise and environmental friendliness.

* Due to the hydraulic cylinder slide, TECHSTER-52 is unable to process crowning grinding.



Die plate

Unequal depth groove grinding

Crowning grinding

Different shape punches

Model		TECHSTER-52	TECHSTER-64	TECHSTER-84
Type		TS-52	TS-64	TS-84
NC control axis		Single 2-axis + traverse 1 axis (Simultaneous 2-axis + traverse 1 axis is optional)	Simultaneous 2-axis + traverse 1 axis	
Standard chuck size (L × W × H)	mm	500×200×85	600×400×85	800×400×100
Travel (traverse/cross/vertical)	mm	600/250	780/450	1000/450
Driving system	Vertical	Ball screw drive and direct drive		
	Traverse	Hydraulic cylinder	Ball screw drive and direct drive	
	Cross	Ball screw drive and direct drive		
Wheel size (OD × width × ID)	mm	φ255×6.4~25×φ50.8	φ355×38~50×φ127 (50Hz) φ305×38~50×φ127 (60Hz)	φ355×38~50×φ127

Rotary surface grinder

SSR5 CNC rotary surface grinder — Rotary surface grinder

High precision ram design and servo motor drive of all spindles

Non-hydraulic, ecological machine

❶Ideal for disc shape and volume grinding

This model is ideal for grinding disc shapes represented by metal saws and slitter knives and volume grinding of production parts.

❷Three times higher productivity than the reciprocation type

Compared with the reciprocation type surface grinders of equal capacity to the SSR-5 (when the entire chuck space is being used), SSR-5 provides three or more times greater productivity.

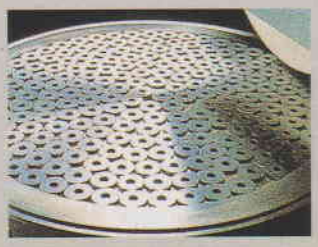
❸Low-environmental load, non-hydraulic

The conventional type of hydraulic system has been eliminated from this model.
Non-hydraulic, environment-friendly NC specifications greatly reduce thermal displacement, producing high precision.

❹All axes NC-controlled

AMADA's original software is now provided for the rotary grinder. As a result, the automatic table dressing and work measurement are possible now.


Metal saw


Grinding production parts


Grinding scene

Model		SSR-5
NC control axis		2-axis + 1 axis
Chuck size (OD)	mm	ϕ508
Travel (ram/table)	mm	335/190
Wheel size (OD × width × ID)	mm	ϕ355×38×ϕ127

Original software

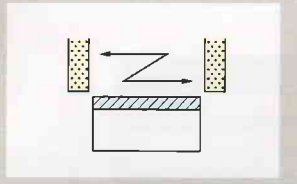
Software to support programming for the surface and forming grinders

Grinding cycle program patterns

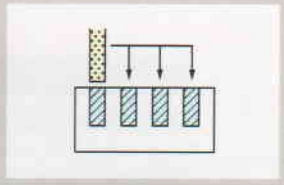
GRINDING CYCLES

These program patterns ease programming for contouring, group grinding, and any other types of grinding.

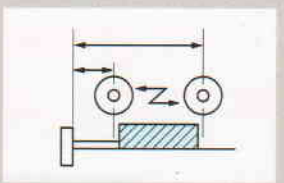
Surface grinding



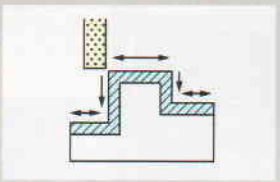
Equal depth groove grinding



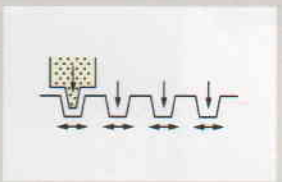
Setting table position



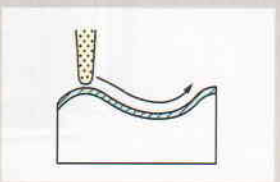
Pattern grinding



Trapezoidal groove grinding



Contouring grinding



Pattern contouring

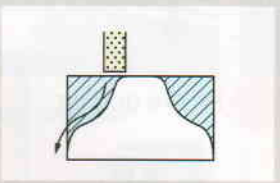
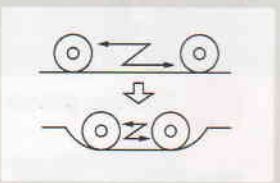
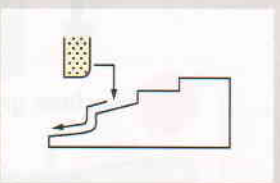


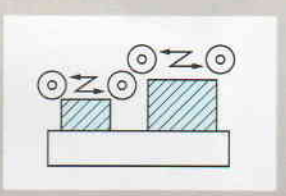
Table stroke



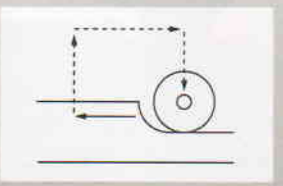
Stepped grinding



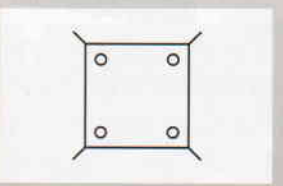
Multiple work feature



Hydraulic creep grinding



Air vent grinding (WAPS WIN required)



Other program patterns include: •unequal depth groove grinding; •traverse jump grinding; •tie-bar grinding.

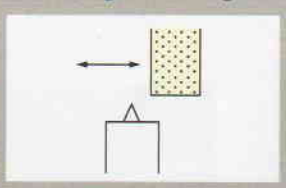
*** Either standard or optional is different for each model. Please contact us for details.**

Dressing cycle program patterns

DRESSING CYCLES

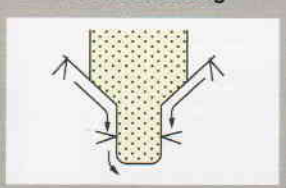
Available cycles include straight dressing, slot dressing, pattern dressing for easy input of most simple forms, and profile dressing for complex G-code profiles.

Straight dressing



Pattern dressing

Profile dressing



Other program patterns include: •grooving dressing.

*** Either standard or optional is different for each model. Please contact us for details.**

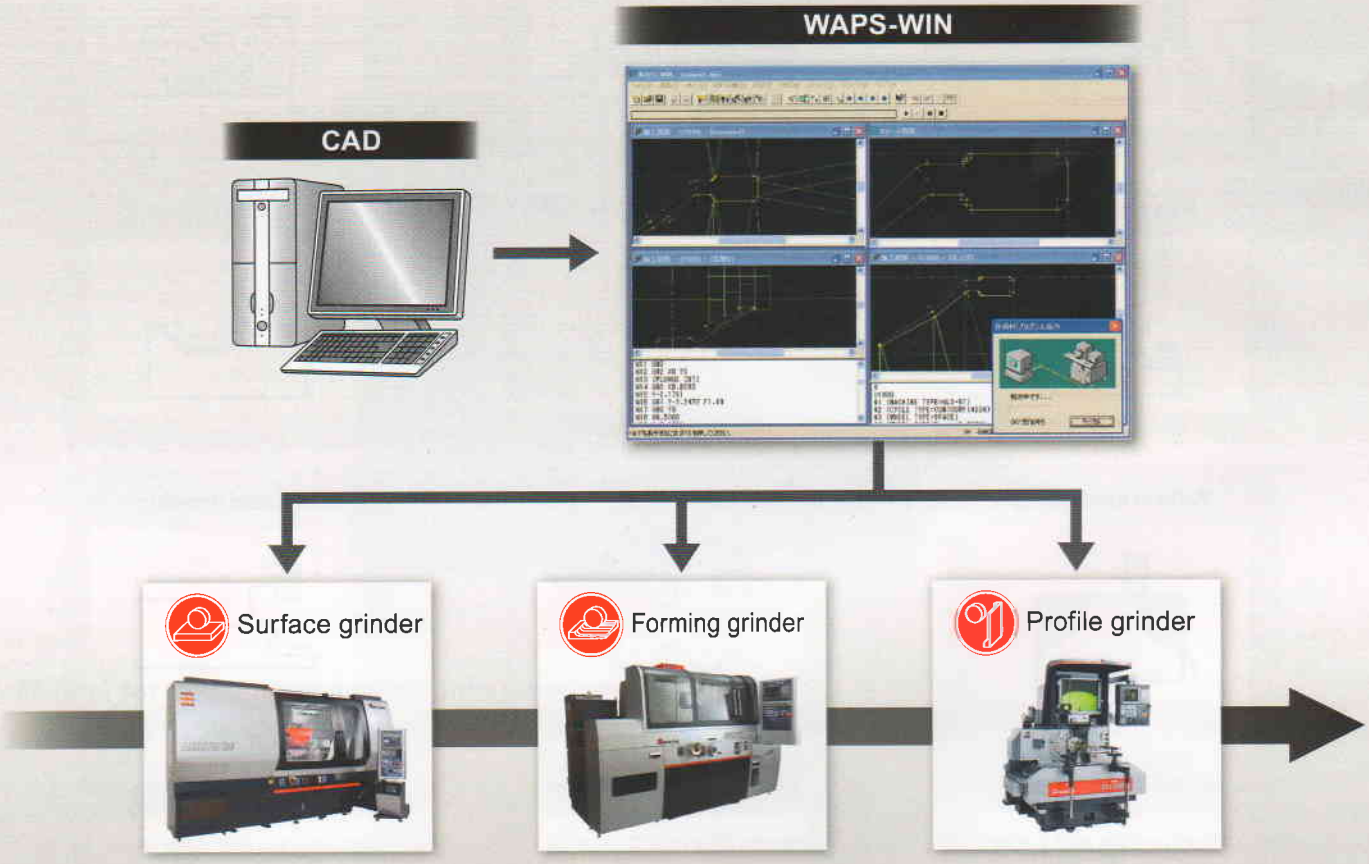
CAM

WAPS SERIES Grinding automatic programming system

CAM

Surface, forming, and profile grinding networked

Steps from start to finish efficiently linked



❶Decreasing man-hours

Work shape is read from CAD data, and programs for roughing, semi-finishing, and finishing, are created on a single WAPS-WIN unit. Programs can be prepared off line which leads to greatly shortened process time and increased machine availability.

❷Incorporating the know-how of forming grinding into software

CAM processing permits instantaneous calculation of tool paths no matter how complicated the shape in question may be. Moreover, more than one grinding program can be controlled at a place.

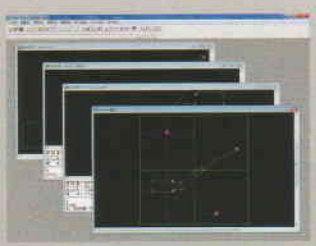
❸The programming system full takes advantage of the strong value added features of the machine

AMADA takes its powerful and advanced grinders and gets full utilization with a custom programming system.

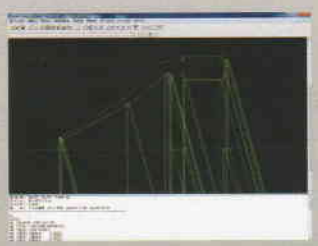
❹Complicated dress forming can be programmed with ease (WAPS-D)

The only requirement is to read CAD data. Then rough and finish dressing data are automatically created, and interference is also automatically avoided.

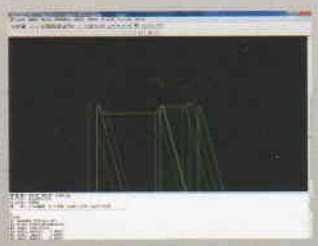
* Supported models: DV-1, GLS series, WINSTAR series, and MEISTER-G3.



Project management



Interference check



Approach and retraction

Dressing cycle (WAPS-D)

Options

Take advantage of AMADA digital solutions for your precision grinding

A variety of accessories that enable single set up solutions which perform all steps from dressing to grinding and inspection to make a complete end product

■On-board measurement system

Touch probe on-board measurement

Measurement starts after a work is ground to specified dimensions during automatic operation based on a fixed cycle.

CCD camera (shape measurement)

Shape measurement on board is now possible. There is no need for removing a work. This decreases man-hours and prevents an error due to attaching during measurement.

■Operation assist

Plotter (PP-600)

Precision chart plotter for profile grinders. Charts are automatically created by reading DXF data.

■On-board dresser

Vertical rotary dresser

This dresser provides high precision and high speed truing. It has a wide range of application in forming without limiting the types of bond.

On-board R-dresser

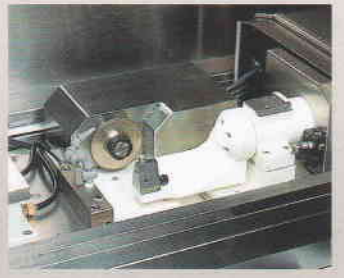
This is used to re-true the radius on superabrasive wheels. It is run by special R-forming dressing software.

NC swivel rotary dresser

This dresser wheel-forms various shapes from taper to straight to round in one pass.

NC profile dresser

This dresser performs wheel-forming with swiveling. Wheel shape is dressed continuously and near perfect because diamond angle stays "normal" to profile.



■Grinding aids

Integrated rotary grinding attachments

Accessories designed to grind cylindrical forms and rotary applications

Large cylinder grinding attachment

Designed grind cylindrical forms for form rolls, circular form tools, etc.

Cutting edge sensor

This sensor is used combined with a three-axis teaching feature. It permits simple grinding of a cutting edge which has a lead.

CNC rotary table

For indexing or contour grinding of rotary parts and tools. Enables completion of part complete in one set up

Before using this product, please read the operator's manual carefully and follow all applicable instructions.

●When using our products, safety equipment is required depending on the operational task.

* These specifications and machinery and equipment appearance are subject to change without notice for reason of improvement.
* The products in the catalog may be subject to the provisions of foreign exchange and the foreign trade law. When exporting cargo subject to such controls, permission pursuant to regulation is required. Please contact our business representative in advance when exporting products overseas.
* The grinding performance data in this catalog for example is affected by temperature, grinding materials, grinding tool and grinding conditions etc. Please note that such data are not guaranteed.
* Please use the machine model name with a hyphen such as TECHSTER-126, when applying for administration applications. Examples: installation report, export, and financing, etc. This includes all other machine model names.
* There may be differences in the specification that has been described in this catalog to the AMADA products which are actually shipped. Please ask our staff for more detail.

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Inquiry

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