

AMADA MACHINERY AMERICA, INC.



THE VISION OF PRECISION

Optical Profile Grinders



Contents

Amada Machinery America	1
Amada Grinding Technology	2

OPTICAL GRINDERS 3

GLS 150GL	4
Optical Profile Grinder	

Amada Machinery America



With more than 70 years of industry experience, Amada Machinery America is committed to helping our customers deliver dependable service and top-quality work with exceptional grinding solutions.

Whether you need profile, forming, surface, or rotary grinding, we have the right solution for your specific needs.

Market-Leading Quality—We believe quality work begins with quality tools designed and built from the ground up to deliver outstanding performance, time after time.

Customer-Driven Innovation—Every feature, function and configuration we offer has been developed to address the needs of our customers.

Proven Accuracy—We help you take your work to the next level and exceed your customers' expectations.

Reliable Productivity—We understand productivity is the heart of your business, and we can help you optimize it in multiple ways.

A History of Cutting-Edge Manufacturing

Since we began building profile grinders back in the 1940s, our goals have always been to provide our customers with increased accuracy and productivity. Throughout our history, we've maintained our time-honored tradition of hand-fitting our grinders to deliver the ultimate in quality and precision.

And, as technology has evolved, we've embraced CNC automation as a core strength, improving throughput and helping new operators become productive more quickly.

Today, we are uniquely positioned to help you expand your capabilities and grow your business.

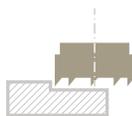
Solutions Designed Around Customer Needs

No two manufacturing needs are exactly alike. Finding the right solution means thoroughly understanding your objectives and configuring a solution to match them precisely. Our engineers bring decades of industry experience to help you achieve your specified goals with a process that fits—and enhances—your workflow.

TECHNOLOGIES OF AMADA



GRINDING



MILLING



SAWING

Amada Grinding Technology



When the tightest tolerances and accurate repeatability matter, Amada is a world leader in optical profile grinding and high-precision surface and profile work. Suppliers to high-tech electronics and semiconductor manufacturers have trusted Amada grinders for years to deliver the flexibility, precision and productivity they need to stay ahead in a rapidly changing industry.

- Integrated measuring technology
- Award-winning innovation
- Maximum accuracy optimized through use of the most modern construction/design
- High speed for increased efficiency
- Integrated automation for higher efficiency
- Automatic swiveling grinding head during the grinding cycle
- External programming software to optimize part production
- Modular construction for versatile and economic specification

Engineered to Perform

Optimum Balance Supports High-Reciprocating Grinding—As a pioneer in high-reciprocating grinding and processing, we have achieved a superb, dynamic balance between the machine and the grindstone to deliver superior performance with the widest range of work materials.

High-Quality Grinding that Exceeds Specifications—The accuracy of our grinding and processing work goes beyond simply measuring RZ to deliver mark-less and sharp-edge mirror finishes.

Reliable, High-Rigidity Structure—The form of the machine has been developed by advanced three-dimensional design and finalized through a comprehensive series of demonstration tests to create high-dimensional rigidity.

Consistent Repeatability—Through superior design and meticulous assembly practices, Amada grinders are engineered to account for thermal displacement, ensuring maximum accuracy throughout the working process.

Advanced, Easy-to-Use CNC Software—Every Amada grinder has dedicated software to allow your operators to take full advantage of each machine's capabilities.

From Surface Grinding to Molding to Profile—Amada's exclusive WAPS platform gives you complete control of all forming processes—rough, semi-finish, and finish processing. It also prepares charts for optical profile grinding and data for profile dressing.

Original Measurement Technology on Equipment—Save time and steps while ensuring maximum accuracy with built-in measurement technology.



GRINDING TECHNOLOGY

Optical Grinders

Amada's optical grinders have set new standards in machining high-precision components for tool and die, mold shops, and the industry in general. With an uncompromising approach to manufacturing standards and extensive engineering expertise, we have helped our customers expand their capabilities and improve their productivity.

GLS 150GL



GLS 150GL Optical Profile Grinder

It took a fresh perspective—and 70 years of industry expertise—to deliver an advanced profile grinder with a light touch. Whether you're making mold slides, machine parts, punches and dies, or core pins, the GLS 150GL delivers the precision and efficiency you need to meet your customers' specifications.



TS-6 High-Precision and High-Rigidity Spindle



Optional TC-20 High-Precision and High-Speed Spindle



Ultra-High Speed and High-Precision Wheel Heads

GLS 150GL Features

High-Accuracy/High-Definition LED Projector

A redesigned long-life LED lighting system increases brightness by approximately 15% compared to existing machines.

High-Reciprocating and High-Accuracy Wheel Heads

High-accuracy and high-resolution optical scales ensure ultra-precise feeding while an extremely rigid frame and a stable, balanced structure deliver high reciprocation rates of 400/min. Reciprocation stroke length is 6.1" (155mm). An oil-cooled inverter (allowing $\pm 0.1^\circ\text{C}$ control) is mounted as standard equipment.

Gravity Center Design Bed

The newly developed bed features an optimized allocation of jack bolts and ribbing, solving flexure at the center and supporting high static accuracy.

User-Friendly Controls—A large 10.4" screen LCD panel and easy-to-use software improve operability and support high-accuracy processing.

Shortened Setup Time—The positioning speed of each spindle axis is increased for improved efficiency, including their fast-forward speed (59"/min., 1,500 mm/min.) and table up-and-down speed (11.8"/min., 300 mm/min.). Dedicated software also enables automatic work setup.

Space-Saving Design—The GLS 150GL is approximately 25% smaller than the previous model, thanks to optimized design based on structural analysis.

High-Precision and High-Rigidity Spindle (TS-6)—The standard low-speed, high-power spindle delivers 6,000 RPM and supports a large-diameter grinding wheel.

Optional High-Precision and High-Speed Spindle (TC-20)—The TC-20 spindle provides high speed (20,000 RPM) and precision with low heat generation.

Newly Designed Ultra-High Speed and High-Precision Wheel Heads—Mirror surface finishing can be achieved in less time, and the 6.1" (155 mm) stroke accommodates a wide range of workpieces.

Tool Grinding Combining NC Swiveling Axis—The edge sensor and three-axis teaching function make grinding of blade edges with lead easy.

Coping with Wet Grinding—The newly designed wet grinding cover allows for bulk flow wet grinding of hard workpieces while reducing heat generation and wear on the grinding wheel.



Tool Grinding Combining NC Swiveling Axis



Shoulder Punch and Die



Core Pins



Ultra-High Speed and Coping with Wet Grinding



Hand Wheels

Optical Profile Grinding to Meet Your Highest Quality and Operation Demands

Operators can easily deliver ultra-precise machining with in-process optical inspection via the projector. This unique technology is what makes the GLS 150GL so popular. Contour accuracies down to $1\mu\text{m}$ can be achieved, and the operator can select the most suitable method of operation—manual, NC-assisted, or CNC controlled with up to three-axis interpolation. Using the teach-in playback function, even grinding wheel wear can be easily compensated.

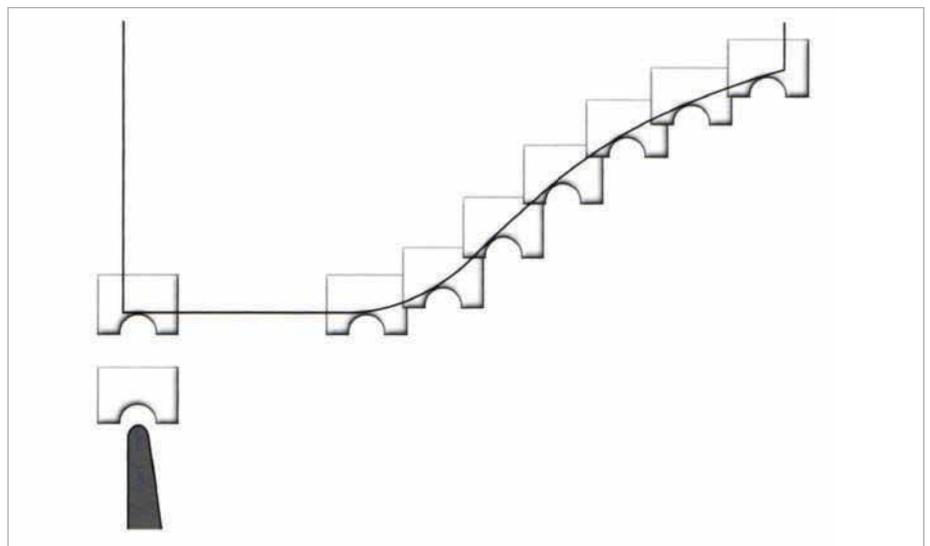
- High-resolution projector with magnifying glass
- High-capacity and friendly FANUC CNC unit
- Fast-stroke system with up to 400 SPM
- Teach-in playback system/macro/external programming
- Built-in coolant systems for maximum accuracy (option)
- Optional C axis for three-axis interpolation



Cutting Tools



Shoulder Punch and Die



Teach-in Playback System



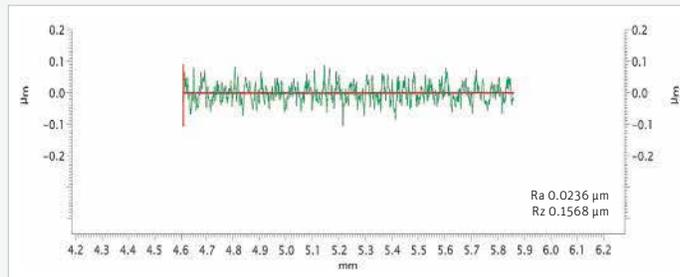
Using a High-Definition Projector



Control Panel

Examples of Mirrored Surface Polishing

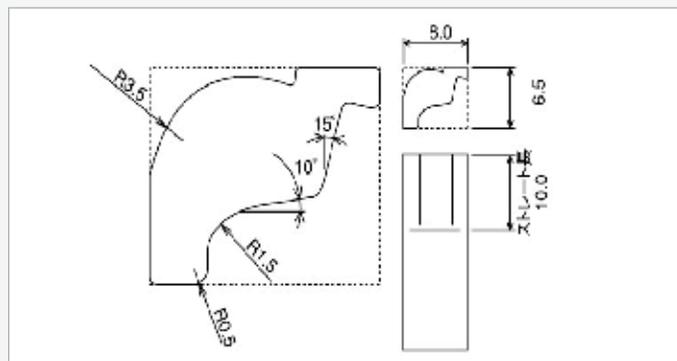
Designed to deliver extreme precision, the GLS 150GL can consistently produce outstanding surface finishes to the tightest tolerances.



Grinding Surface Finish



Wheel Head Design Based On Structure Analysis



Sample Piece

Material: G5 (Cemented) Grinding Time: (Finish) 18 min
 Reciprocation Stroke: 13 mm (Grinding Accuracy) ± 0.001 mm

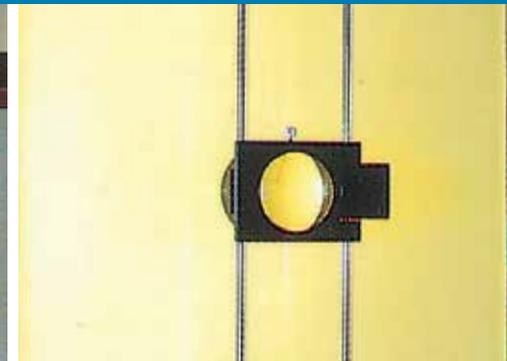
GLS 150GL OPTICAL PROFILE GRINDER



Auto Balancer



On-Board R-Form Dresser MRD-180



Screen Loupe

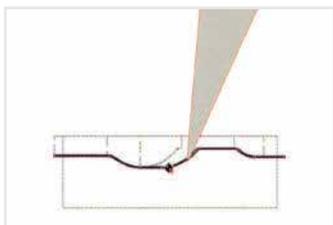
PROGRAMMING OF THE GLS 150GL

The GLS 150GL offers operators a choice of operating methods to match their desired way of control or operating skills.

- Manual operation using the hand wheels
- Using the teach-in playback system
- Using standard cycles (macro programming)
- Using external programming software



Taper Interpolation



External Programming

Options for Specific Applications

Auto Balancer—This measuring instrument is used to adjust the balance of the wheel and spindle as a single unit. Perfect balancing improves the ground surface roughness.

On-Board R-Form Dresser MRD-180—This table-mount dresser is used for reforming the radius of the profiling wheel, and it's easily programmed by the operator.

Screen Loupe (P.A.T.)—The screen loupe is used to verify the work profile by partially magnifying its enlarged image and the chart for comparison. As it fits into the screen frame, both handles can be operated at the same time. Loupes are available in 2.2x and 4x magnification.



Circular Grinding Attachment—

This attachment is used for grinding cylindrical parts/tools, etc.

- Swing: Ø7.87" (200 mm)
- Distance between centers: 7.87" (200 mm)
- Adaptable to dead or live centers



Automatic Work Swivel Unit (mounts to Ø1.26" [32 mm] hole)—

The automatic work swivel unit can be set to an indexable angle or to continuous feed applications. One setting can provide complete periphery processing of the work.

Machine Specifications

TABLE	Working surface (L x W)	15.7" x 9.8" (400 x 250 mm)	
	Travel	Traverse feed	11.8" (300 mm)
		Cross feed	5.9" (150 mm)
		Minimum input increment	0.000010" (0.0001 mm)
		Position detection system	Semi-closed loop
WHEEL HEAD	Reciprocating slide stroke	0~6.1" (0~155 mm)	
	Reciprocation speed	30~400* SPM	
	Travel	Traverse feed	7.87" (200 mm)
		Cross feed	5.9" (150 mm)
		Minimum input increment	0.000010" (0.0001 mm)
		Position detection system	Full-closed loop
	Relief angle	Radial direction of wheel	-2~+20 °
		Axial direction of wheel	±15 °
Swivel slide swiveling angle	±15 °		
PROJECTOR	Screen size (W x H)	21.25" x 16.5" (540 x 420 mm)	
	Magnification	20x, 50x	
WHEEL SPINDLE	Size (OD x width x bore)	Ø4.72"~7.08" x 0.12"~0.39" x Ø1.25" (Ø120~180 x 3~10 x Ø31.75 mm)	
	Wheel spindle speed	1000~6000 RPM (TS-6)	
	Motor capacity	2 HP~4 P (1.5~4 kW-P)	
FLOOR SPACE (WIDTH X DEPTH)	69.29" x 68.89" (1760 x 1750 mm)		
MACHINE WEIGHT	9900 lb (4500 kg)		
POWER CAPACITY	18 kVA		
CNC CONTROLLER	CNC unit model	FANUC	
	Display	10.4" (264 mm)	
	Manual handle	2 : X, Y (Z, V)	
	Pitch error modification	Standard	
	Number of axes	4 axis (simultaneous 2 axis)	

*Reciprocation process speed is changed by the time of reciprocation process.