AMADA MACHINE TOOLS AMERICA, INC.

THE VISION OF PRECISION

Optical Grinders

AMADA®

Contents

Amada Machine Tools America 1
Amada Grinding Technology 2

OPTICAL GRINDERS 3

GLS 150GL 4
Optical Profile Grinder

DV1 10
Digital Profile Grinder

Amada Machine Tools America

With more than 70 years of industry experience, Amada Machine Tools 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.

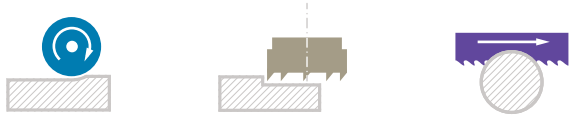
And, as technology has evolved, we've embraced CNC automation as a core strength, improving throughput and helping new operators become productive more quickly.

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 ±0.1°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.

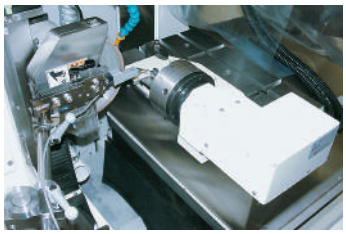
High-Precision and High-Rigidity Spindle (TS-6)—The standard low-speed, high-power spindle delivers 6,000 RPM and supports a large-diameter grinding wheel.

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.

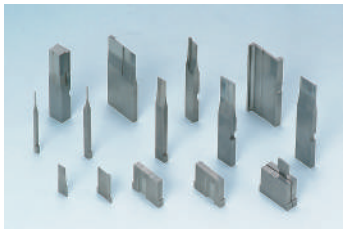
Newly Designed Ultra-High Speed and High-Precision Wheel Heads—Mirror surface finishing can be achieved in less time, and the 6.1" (155 mm) stroke accommodates a wide range of workpieces.

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.

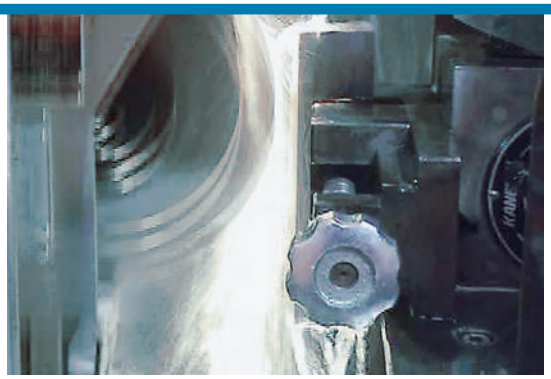


Tool Grinding Combining NC Swiveling Axis



Shoulder Punch and Die

Core Pins



Ultra-High Speed and Coping with Wet Grinding

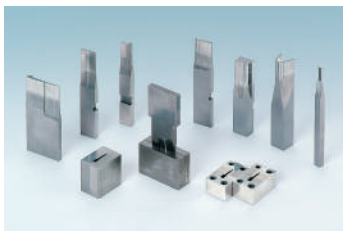
Hand Wheels

Optical Profile Grinding to Meet Your Highest Quality and Operation Demands

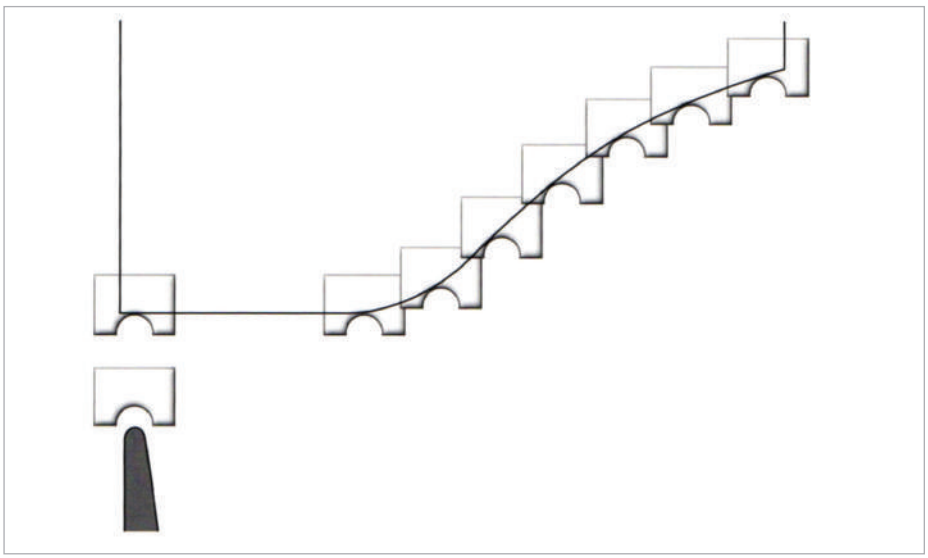
Operators can easily deliver ultra-precise machining with in-process optical inspection via the projector. This unique technology is what makes the GLS 150GL so popular. Contour accuracies down to 1µm can be achieved, and the operator can select the most suitable method of operation—manual, NC-assisted, 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



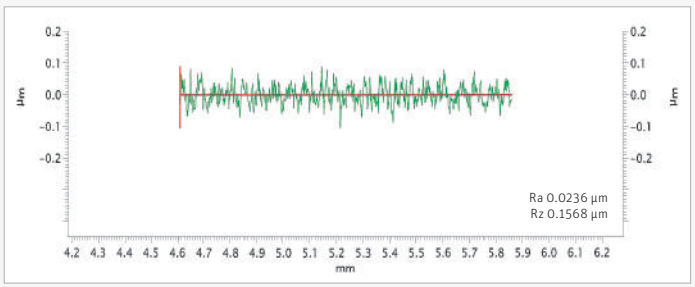
Teach-in Playback System

Using a High-Definition Projector

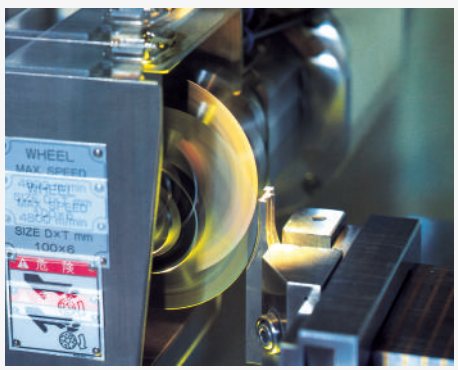
Control Panel

Examples of Mirrored Surface Polishing

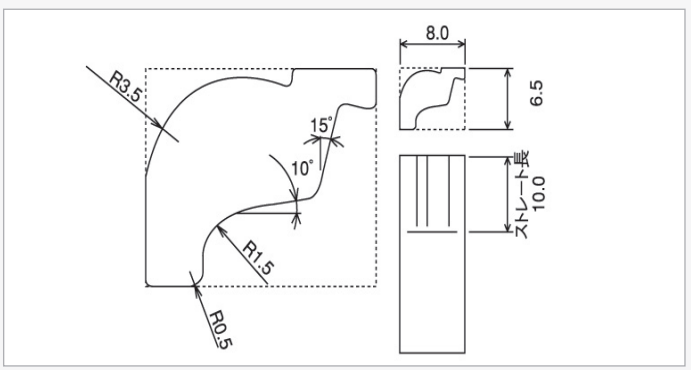
Designed to deliver extreme precision, the GLS 150GL can consistently produce outstanding surface finishes to the tightest tolerances.



Grinding Surface Finish

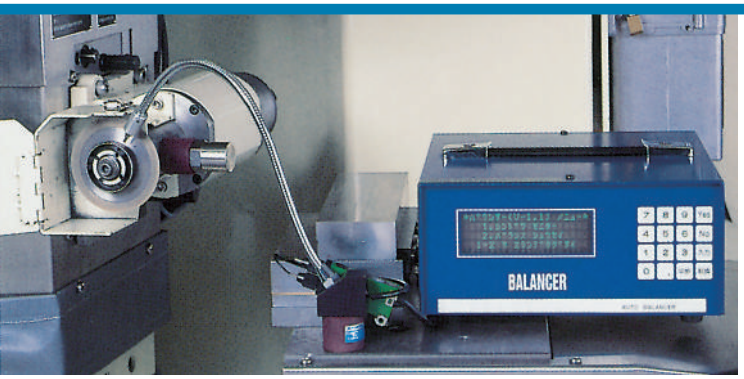


Wheel Head Design Based On Structure Analysis

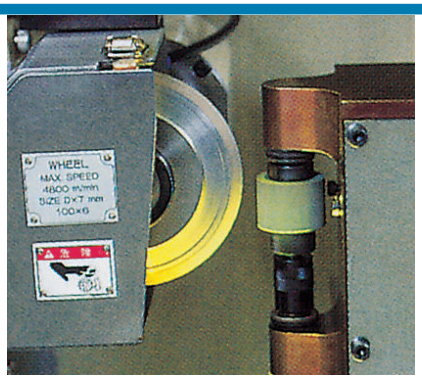


Sample Piece

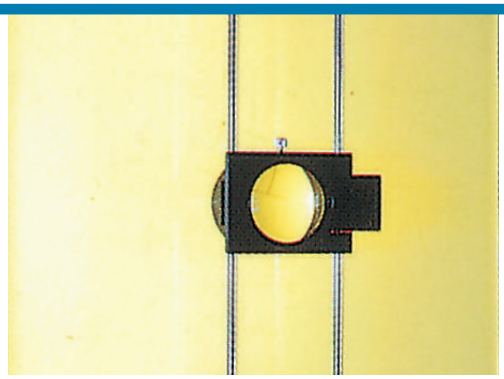
Material: G5 (Cemented)
Reciprocation Stroke: 13 mm
Grinding Time: (Finish) 18 min
(Grinding Accuracy) ±0.001 mm



Auto Balancer



On-Board R-Form Dresser MRD-180

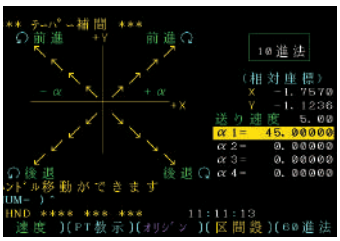


Screen Loupe

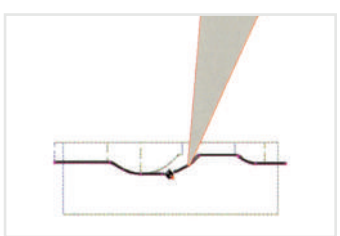
PROGRAMMING OF THE GLS 150GL

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

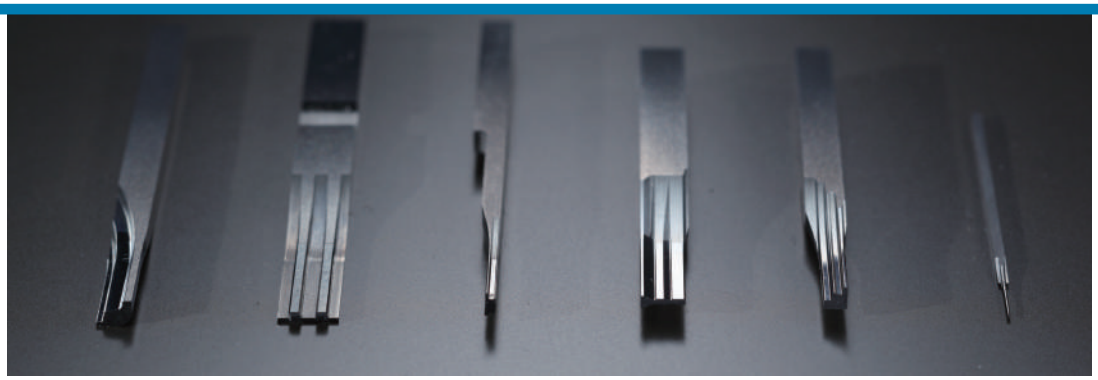
TABLE	Working surface (L x W)		15.7" x 9.8" (400 x 250 mm)
	Travel	Traverse feed	11.8" (300 mm)
		Cross feed	5.9" (150 mm)
		Minimum input increment	0.000010" (0.0001 mm)
		Position detection system	Semi-closed loop
WHEEL HEAD	Reciprocating slide stroke		0~6.1" (0~155 mm)
	Reciprocation speed		30~400* 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.*

DV1

DV1 Digital Profile Grinder

Take your optical profile grinding to the next level with a compact, chartless, and fully automated third-generation profile grinder. Available with five-axis control (for superior surface finishing), the DV1 can also be specified with 16 pallet stations for automatically changing out workpieces and grinding wheels, giving you the ultimate in truly “hands-off” productivity in one compact, user-friendly package.



Ultra-Precision Shoulder Punches

CCD Camera System

DV1 Features

Compact, Fully Enclosed Design—A full cover improves operational safety and environmental performance while still allowing easy access for operators.

Four-Sided Grinding for Maximum Efficiency—The CNC rotary table allows for full periphery processing with one chucking.

Automatic Measurement and Compensation Processing—The fully automated DV1 incorporates a state-of-the-art CCD camera system for automatic, on-machine measurement and compensation. That means improved precision and consistency on every job.

Process Stability—Through completely unmanned and chartless finish processing, variations in processing standards are remarkably reduced.

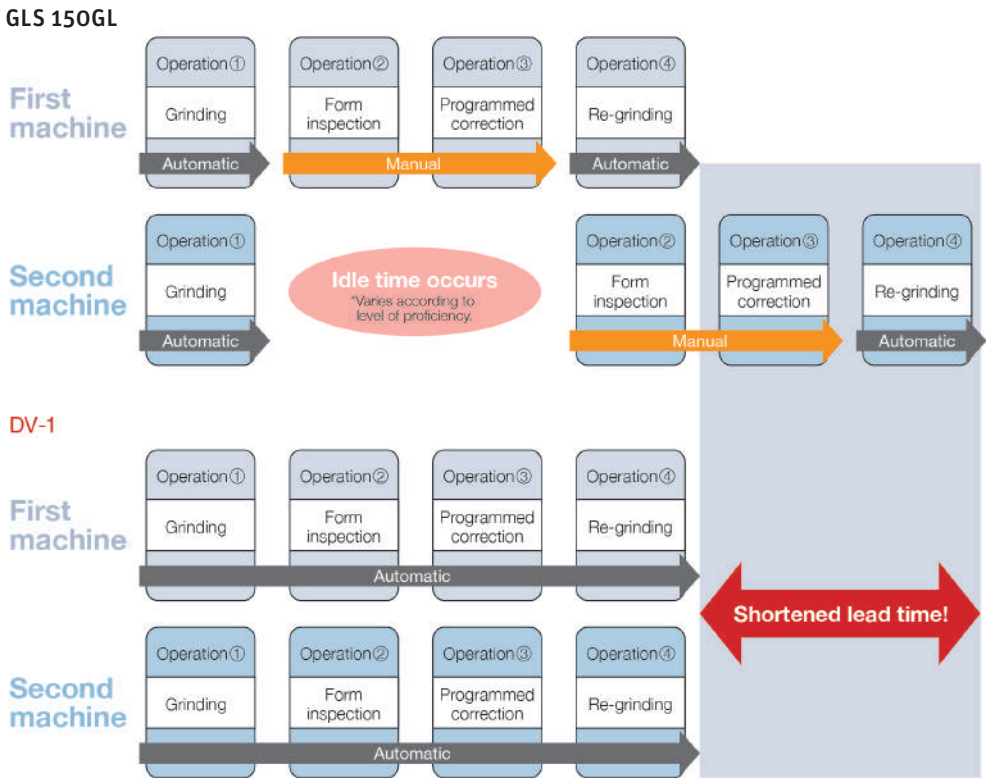
Verify Very Small, Fine Shapes—The automatic inspection system can qualify very small shapes of 1-degree angles or less, which cannot be easily measured with a projector.

Ideally Suited for Precision Carbide Punch Grinding—The DV1 can consistently deliver inside form tolerances of 0.0001".

CCD Camera Automatic Instrumentation and Automatic Compensation Grinding System—Optical resolution of 10x and monitor resolution of 350x is standard equipment on the DV1. With the proven CCD camera image processing technology, full automation is achieved throughout measurement and automatic program editing.

Comparing Optical Grinding to Digital Grinding

If you use two machines for one worker, our optical profile grinder GLS 150GL requires manual form measurement and program correction, resulting in idle time for a machine. In contrast, the DV1 can perform this task automatically, resulting in shorter lead times and improved productivity.



The Leader in Profile Grinding Goes Digital

Structural analysis, including 3D design, provides rigidity and compact design for the DV1. LCD displays and CCD cameras have replaced the traditional projection systems, and Mylar charts are replaced by CAD-based digital profiles. The net result is that program creation can now be based on actual digital data. Also, because the system is chartless, there's no need for a plotter. In addition, the original image teaching program function uses the CCD camera without a projector (as standard equipment), allowing for chartless instrumentation. This also allows the use of full-enclosure guards for high-performance design characteristics without any compromise in basic work efficiency.

CNC Rotary Table

Optional Full Automation Available

Operation Panel Screen

Productivity Made Easy

CNC Rotary Table Allows Four-Sided Grinding for Maximum Efficiency—With a CNC rotary table as standard equipment, the DVI is capable of full periphery processing with one chucking. Multiple wheel operations for roughing all sides of the workpiece can be completed—completely unattended—before changing the wheel for finishing.

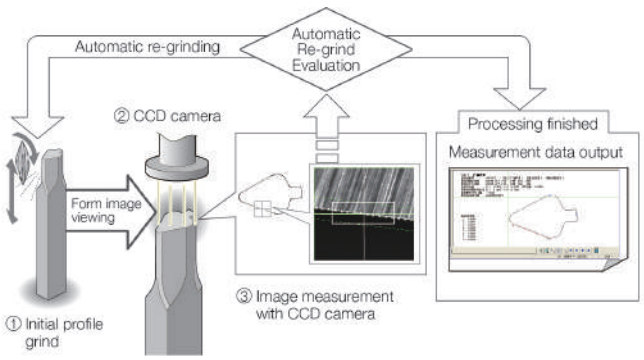
Easy-to-Use PC NC Interface—The PC NC operation software, accessed through a 12-inch color touch panel, significantly improves operability. The new layout of the operation panel organizes the function for both ease of use and clarity. Optimum usability makes this powerful grinder technology a pleasure to operate.

Optional Full Automation Available—With the addition of articulated robots for automated workpiece exchanges and wheel changes on the ATC spindle, the DV1 is capable of running completely unattended.

Automation that Drives Accuracy

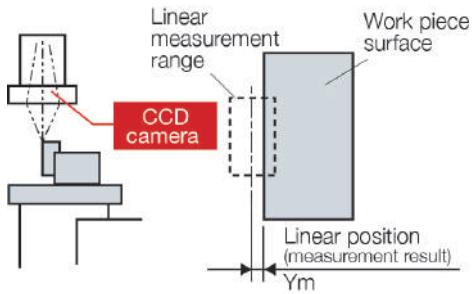
The implementation of CCD camera systems puts the DV1 in a new class of grinding technology.

1 Automatic measurement of workpiece form with automatic re-grinding ensures repeatable precision.

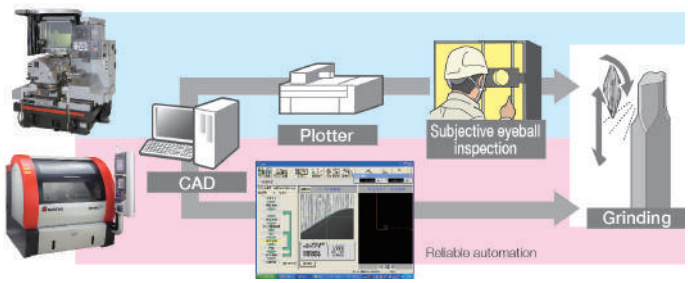


2 The DV1 can process ultra-small workpieces below an angle of 0.04" (1 mm), which is difficult to measure with a projector. In addition, the edge compensation function ensures consistency of inspection.

Horizontal edge (Y axis)
σ= 0.019 mm
Vertical edge (X axis)
σ= 0.013 mm

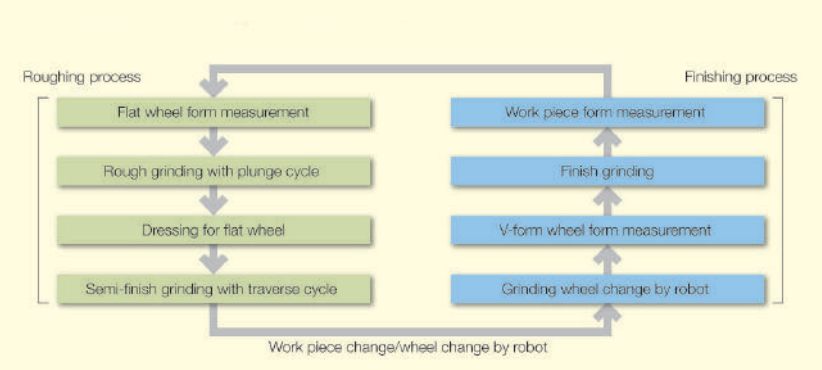


3 Automated CCD camera measurement eliminates subjective manual inspection, dramatically reducing variations in processing quality.



4 Measurement data can be output, providing documented part qualification.

5 Grinding wheel form measurement can be performed.



Full Automation for Roughing and Finishing Operations

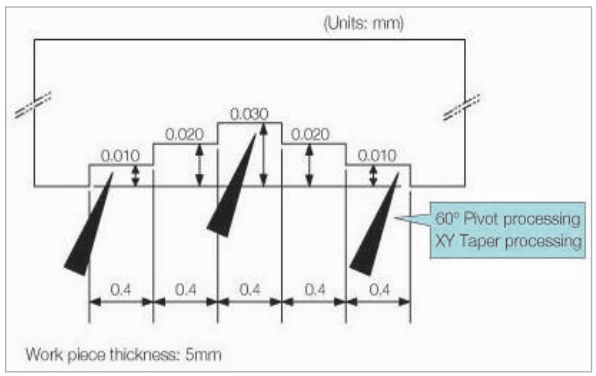
Fully Automated Part Production with Articulated Robot and Stocker

Through automatic wheel changing, rough and finish operations are seamless and can be conducted completely unattended. The ATC spindle automatically clamps the necessary wheels to fully process workpieces, unattended. Measurement software for flat (1A1) grinding wheels automatically qualifies the wheel width/position, and an integrated rotary dresser provides peripheral, side, and corner radius dressing in flat wheels for semi-finish operations. Rough plunge cycles speed throughput.

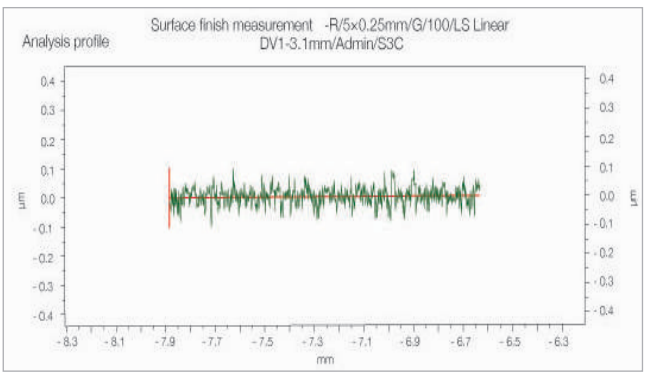
Five-Axis Controls For High-Quality Surface Finish

Uncompromising Machine Design for High-Precision Form Processing

Five-Axis Controls for High-Quality Surface Finish—The DV1 employs a crank-motion elevating stand to achieve superior surface finish. The TC-20 spindle (developed by Amada for 20,000 RPM performance) supports high precision and high speed when creating small and medium shoulders. Integrated front and side clearance ensures angles that satisfy die specifications.



Grinding Step Profile



Surface Finish Measurement Data

Precision in Part Processing

An ultra-hard workpiece 0.1" (2.5 mm) thick is precision-ground to within 1µm. Test piece is five steps of 10µm, as pictured, with grinding, measurement and compensated re-grind. A work surface finish of Rz0.16µm is achieved, showcasing the DV1's ability to produce "light" surface finishes.

10µm step grinding (5 steps) with automatic compensated re-grind

- Processing material: ultra-hard (G5 equivalent)
- Main spindle rotation speed: 12,000 RPM
- Reciprocation speed: 120 RPM
- Grinding wheel: TWD700R2
- Grindstone size: Ø3" x Ø0.87" (Ø75 x Ø22.23)
- Single V15º: R0.05

Straight processing (X-axis shift)

- Processing material: ultra-hard (G5 equivalent)
- Main spindle rotation speed: 12,000 RPM
- Reciprocation speed: 100 RPM
- Depth of cut: 0.0002" (0.005 mm)
- Feed speed: 0.04"/min. (1.0 mm/min.)
- Measuring machine: surface finish measuring instrument (Taylor Hobson)
- Grinding wheel: TWD700R2
- Grindstone size: Ø3" x Ø0.87" (Ø75 x Ø22.23)
- Single V15º: R0.05
- Wheel dressing device: MRD-180 dress after ~10 min. grinding time
- Dressing time: 5 min. (finish only)

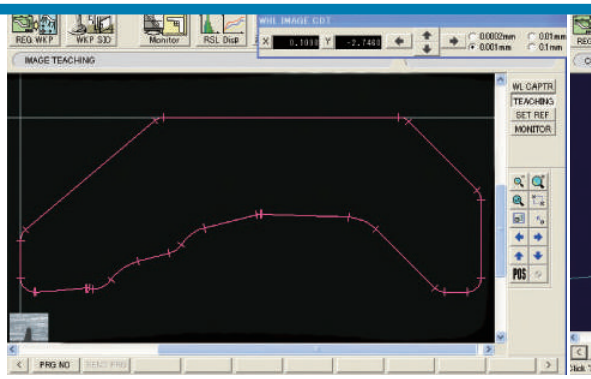


Image-Based Teach and Playback

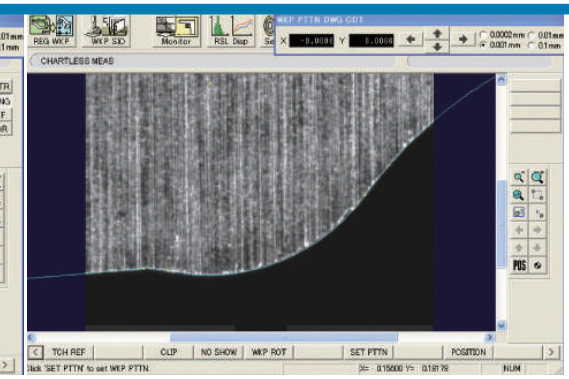
Custom Software and Craftsmanship in a Digital World

The new operation panel is designed for ease of use, and the control system allows intuitive navigation through all the powerful functions.

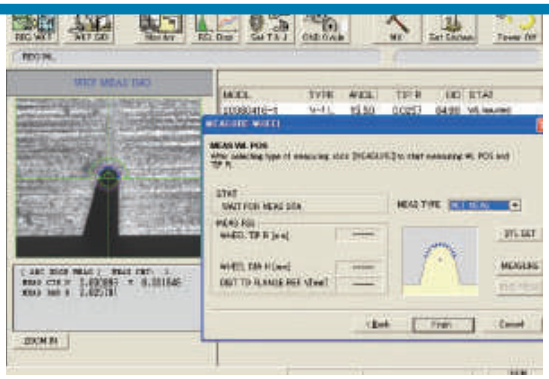
FANUC Series 32i-B—Five-axis control specification:

- Table X, Y
- Table up/down (Z)
- Headstock up/down (W)
- Workpiece pivot (B)

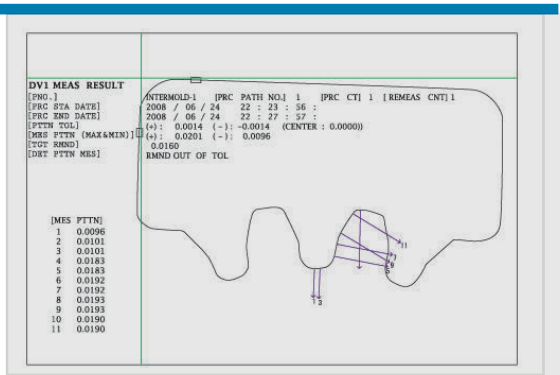
12-inch Color LCD Touch Panel (top)
USB Port (above)
Operation Panel (right)



Chartless Measurement



Automatic Workpiece Form Measurement/ Compensation Processing



Grinding Wheel Position and Shape Measurement

Software

The custom software on the DV1 is designed for maximum productivity.

Image-Based Teach and Playback—Image-based teach and playback software can create programs visually using monitor images of digital profiles, providing digital accuracy instead of projector-and-chart methods. Additionally, using digital profiles enables automatic measurement of the workpiece profile by measuring the CCD camera image of the workiece against the actual digital image.

Image teaching provides an actual, wheel-based profile by capturing digital images of the 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 data, the position of the workpiece image is set. When the manual handle is turned, the workpiece image moves. Similarly, by moving the cursor on the NC screen, the workpiece image moves, and the software can determine the difference.

Automatic Workpiece Form Measurement/ Compensation Processing—After the grind operation is finished, the standard position is confirmed and measurements are made to determine the 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 deviations from the standard are disregarded. The measured image area is as small as 0.019" (0.5 mm). In order to measure areas less than 1µm, the number of pixels and dots is set.

Grinding Wheel Position and Shape Measurement—The on-board dresser unit re-trues the leading edge radius of the grinding wheel. The shape of the grinding wheel is plunged into the dummy workpiece fixtured to the table. Through the dummy, the profile of the grindstone radius is measured at multiple points, and determined by CCM calculations. Taking measurements at multiple points minimizes errors. This procedure automatically qualifies both the wheel radius and wheel position, greatly facilitating the setup process.

Machine Specifications

PROJECTOR	Screen size			12" LCD (CCD view range 0.5 x 0.4 mm)
	Magnification			Optical magnification x10/monitor magnification x350
	Lighting			Tapering lighting 150 W
TABLE	Working surface			4.5" (Ø115 mm) (round table)
	Distance from the table top to focus point			7.8" (200 mm)
	Maximum loading weight			44 lb. (20 kg) (workpiece + fixture + chuck)
	Linear axis	Travel	Traverse feed (X axis)	11.8" (300 mm)
			Cross feed (Y axis)	9.8" (250 mm)
			Vertical feed (Z axis)	3.1" (80 mm)
		Feedrate	Rapid traverse (G00)	XY: 78"/min, Z: 19.6"/min (XY: 2000 mm/min, Z: 500 mm/min)
			Linear interpolation (G01)	XY: 0.0004~39"/min (XY: 0.1~1000 mm/min, Z: 500 mm/min)
		Jog feed		XY: 78"/min (2000 mm/min), Z: 19.6"/min (500 mm/min)
		Minimun input increment		0.000010" (0.0001 mm)
		Position detection/ scale resolution	X and Y axes	Full-closed/0.05 µm
			Z axis	Semi-closed
	Rotary axis B	Travel		360°
		Feedrate	Rapid traverse (G00)	1000°/min
			Linear interpolation (G01)	0.1~1000°/min
		Jog feed		1000°/min
		Minimun input increment		(0.0001°)
		Position detection/scale resolution		Full-closed/±5°
WHEEL SPINDLE	Wheel size (outer diameter x width x hole diameter)			Ø2.5"~3.9" x 0.15"~0.25" x 0.875" (Ø65~100 x 4~6 x Ø22.23 mm)
	Spindle nose			Ø1.0" (Ø25.4 mm) 1/4 taper
	Spindle speed			2000~20000 min^{-1} (TC-20)
WHEEL HEAD	Reciprocating axis	Reciprocating slide stroke (W axis)		0 – 3.14" (0~80*[1] mm)
		Drive system		Crank
		Reciprocation speed		1.18"~15.7" (30~400 mm) (in case of 10st)*[2]
	Relief angle	Travel	Radial relief angle (V axis)	-1~2° (manual operation)
			Axial relief angle (A axis)	±3° (manual operation)

MOTOR	Wheel spindle	2 HP~4P (1.5~4 kW-P) (TC-20)
	X/Y axes	1 HP (0.75 kW)
	Z axis	.67 HP (0.5 kW)
	B axis	.06 HP (0.05 kW)
	Reciprocating axis (W axis)	2.5 HP (1.8 kW)
	Automatic lubrication	4 W
POWER CAPACITY		13 kVA
MACHINE SIZE (WIDTH X DEPTH X HEIGHT)		64" x 93" x 67" (1630 x 2370 x 1717 mm)
MACHINE WEIGHT		8800 lb (4000 kg)

[1] Length that can be processed will vary depending on the setting of relief angle.
[2] There is limitation depending on the reciprocation stroke.

NC Control Specifications

CONTROL UNIT MODEL		**FANUC SERIES 180i-MB**
NUMBER OF CONTROL AXES	5-axis control specification	Table X, Y; table vertical Z; reciprocation W; workpiece rotary B
STANDARD FUNCTIONS	12" color LCD (touch panel)	Manual reference return
	PC NC (O/S Windows XP)	Memory-type pitch error compensation
	CNC screen display function	Feedrate override 0 to 200%
	Wheel spindle infinitely variable-speed drive (inverter control)	Tape memory 40m (16kB)
	Simple S command (7-speed)	Registerable programs 63
	Reciprocation 20-speed (servo control)	Total tool offset pairs 32
	Circuit breaker (30mA)	Tool length compensation
	Auto power off	Rapid speed override
	AC100V outlet (2P-1 outlet)	Warm-up timer (daily timer)
	3 manual handles (5-spindle control specification: common to X axis, Y axis, Z/B axis)	Memory card I/O
	Handle magnification ratio Off, x1, x10, x100	Table setup function
OPTIONAL FUNCTIONS	Additional memory (80, 160, 320, 640, 1280m)	Run hour and parts count display
	Additional registerable programs (125, 200, 400)	Cycle time stamp function
	Additional tool offset pairs (64, 99, 200, 400)	Automatic corner override
	Weekly timer	
	I/O interface	
	LAN connection (additional Ethernet function/connector for the PC part) *[3]	

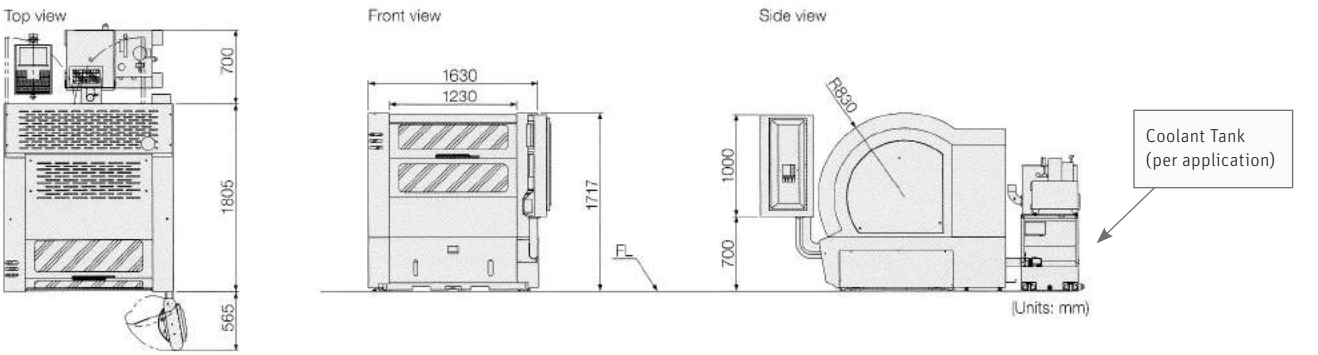
[3] Device for LAN connection is added. The network connection for the PC part should be set by customer.

Software

DV1 SOFTWARE (APPLICATION FOR PC)		CONVERSATIONAL MICROSOFTWARE, ETC.
STANDARD FUNCTIONS	Image teaching playback	Wheel data recording function
	Chartless measurement	Fixture recording function
	Processing simulation display	Simple S command (7-speed)
	Workpiece standard measurement	Warm-up setting
	Processing actual performance display	
	Wheel position measurement (wheel transcription form measurement)	
	Automatic workpiece form measurement/correction processing software	
OPTIONAL FUNCTIONS	Rough grinding cycle	Taper interpolation
	R-forming dress software	Simple circular interpolation
	Outside auto programing software ASSIST DV*4	Repeat cycle
		Run hour display function

*4 *Not compatible with WAPS WIN.*

Floor Layout DV1 Stand-Alone Specification



Multi-Axis Robot Stocker Specification

ROBOT	Robot	Manufacturer: FANUC	
	Number of controlled axes	6 axes	
	Maximum travel	35" (892 mm)	
	Maximum delivery weight	11 lb (5 kg)	Including robot hand
	Machine weight	63 lb (29 kg)	
STOCKER	Maximum number of stocked pallets	12 pieces	4 pallet x 3
	Maximum number of stocked wheel flanges	4 pieces	4 tools x 1
	Maximum workpiece size	4.5" x 3.5" (Ø115 mm x 90 mm) from pallet top surface	Pallet diameter 3.14" (Ø80 mm) is available
	Maximum wheel size	Ø2.9"~3.3" x 0.15"~0.23" (Ø75 mm~85 mm x 4 mm to 6 mm)	

See Amada Grinders at Work

The AMTA Technical Center was created to provide a unique environment for visitors to experience the latest manufacturing technology in action. This stunning 40,000-square-foot facility houses the latest Amada technology in each product group. Much more than just an exhibit, every machine, automation accessory, and software program in the facility is fully operational and ready to empower customers to solve their most challenging manufacturing applications.

At **AMADA MACHINE TOOLS AMERICA**, we're committed to your success. More than just a provider of precision metalworking solutions, we're a partner who can help you meet the advanced engineering and manufacturing challenges unique to your industry. Together, we can create the right solution to meet your needs today and empower you to build your business for the future.

AMADA MACHINE TOOLS AMERICA, INC. **www.amadamt.com**

MAIN OFFICE

2324 Palmer Drive
Schaumburg, IL 60173
tel (847) 285-4800
fax (847) 519-2127

BRANCH OFFICE

7025 Firestone Blvd
Buena Park, CA 90621
tel (714) 739-2111

BANDSAW AND BLADE BUSINESS

bandsaws@amadamt.com
bladeorders@amadamt.com
bandsawparts@amadamt.com
bandsawservice@amadamt.com

GRINDER BUSINESS

grinders@amadamt.com
grinderparts@amadamt.com
grinderservice@amadamt.com