OKUMA

OPEN POSSIBILITIES

CNC Cylindrical Grinders

GPW/GAW series

GP14W/GP15W/GA14W/GA15W

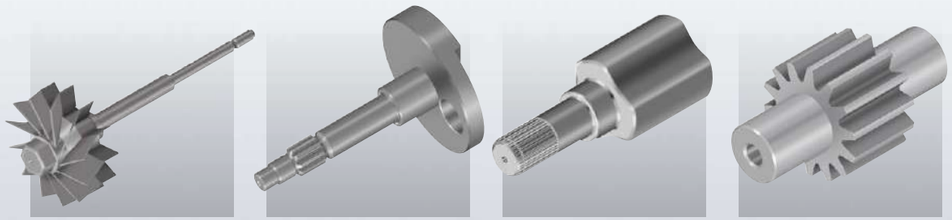
CNC Cylindrical Grinders

GPW/GAW series

GP14W/GP15W/GA14W/GA15W

Operation that can be done easily by anyone
The best compact machine for mass production machining

GPW/GAW Series machines can be operated without difficulty by anyone using Easy Operation with OSP-P300GA.
Stable, high-accuracy grinding of small parts used in automobiles, motorcycles, hydraulic equipment, home appliances, and more.
These compact machines especially for small workpieces give high-accuracy mass-production machining.



Compact body and space-saving footprint

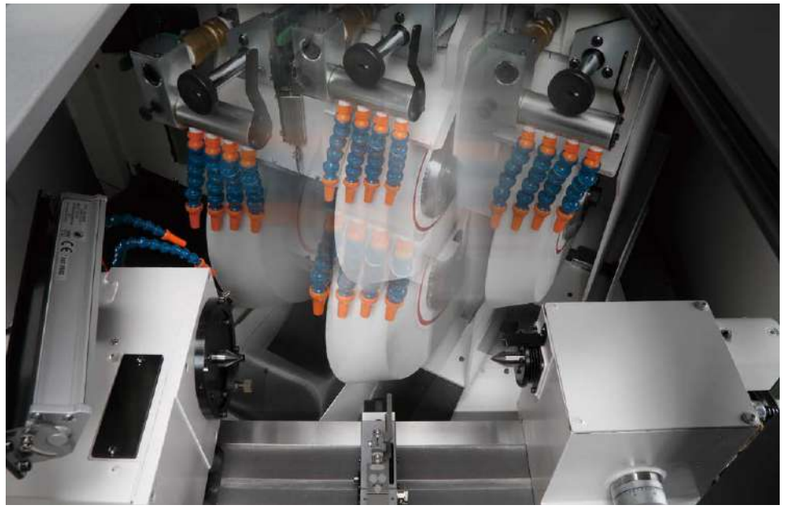
A compact body with machine width of 1,550 mm and space-saving footprint are achieved thanks to wheelhead traverse structure. This makes it possible to shorten operator or automatic equipment work lines and contributes to higher work efficiency.

OSP-P300GA gives outstanding operability

For the OSP-P300GA, operator work procedures were thoroughly analyzed to give operator-friendly operability. Even novices can operate machines without difficulty, greatly increasing work efficiency.

Photos shown in this brochure may also show optional equipment.

The best monozukuri practices balance high-accuracy machining and workability



Workpiece headstock

Tailstock

Smaller machine space achieved with use of wheelhead traverse structure

A wheelhead traverse structure requires a stronger foundation than a table traverse structure. Okuma's high-rigidity technology meets the conditions needed for a wheelhead traverse structure to achieve a compact body.

Superior user-friendly design supports automation

The upper portion of the front door can accommodate various loader positions. Line flexibility from the space-saving design also contributes to greater automation.

Technology on every part of the machine contributes to higher machining accuracy

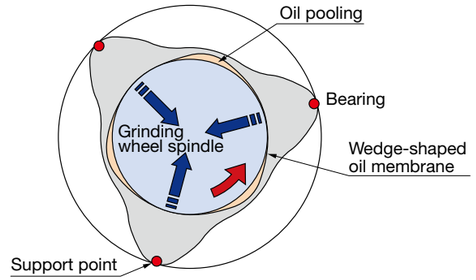
An oil pan structure to minimize effects on the coolant, high following characteristics carefully fitted with a V-plane slideway, and other individual technologies on each part of the machine further improve machining accuracy.

Chatter control function supports stable, high-accuracy machining

"Chatter control function" automatically changes wheel speed and controls regenerative chatter. Stable machining accuracies can be maintained at all times.

Dynamic pressure bearing structure gives efficient machining even in heavy-duty cutting

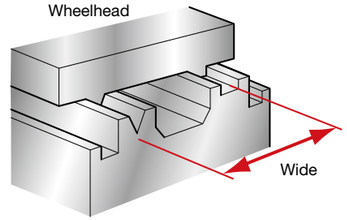
Non-round plain bearing wheel spindle with a dynamic pressure structure supports the wheel spindle with wedge-shaped oil film pressure that is generated by wheel spindle rotation. Retention strength is a powerful 1 t, in addition to which wheel rotation accuracy is kept to within 0.01 µm for a good balance of high accuracy grinding even in heavy-duty cutting. Also, because the wheel spindle has no metal contact, its original performance is maintained semi-permanently.



Stress analysis with FEM analysis

High machining efficiency maintained with wide V—Flat guideway

A widened V—Flat guideway system is used that expands the span between the V and Flat guideways beneath the saddle. Higher workpiece support rigidity enables grinding with full power of 5.5 kW (optional 7.5 kW). The grinding load on the wheelhead during heavy-duty grinding is supported by wide V—Flat guideway for high machining efficiency.



Machining time is shortened with high speed feed at the top level in the class

Structure with unrivaled high following characteristics gives high feed speeds of ø30 m/min on the X axis and 20 m/min on the Z axis. Shorter non-cutting times contribute to improved machining efficiency.

- X-axis feedrate: ø30 m/min
- Z-axis feedrate: 20 m/min

Reduced burden in adjusting for taper changes with use of tailstock with manual taper compensation function

Adjustments can be easily made for taper changes that occur with tailstock travel

Machine Specifications

Items		Unit	GP/GA14W	GP/GA15W
Distance between centers		mm (in.)	250 (9.84)	
Swing over table		mm (in.)	ø330 (ø12.99)	
Max grinding dia		mm (in.)	ø150 (5.91)	
Maximum wheel diameter		mm (in.)	ø405 (ø15.94)	ø510 (ø20.8)
Maximum workpiece length		mm (in.)	250 (9.84)	
Max workpiece weight	Center supported	kg (lb)	20 (44)	
	Chuck supported	kg × mm (lb × in.)	10 × 100 (22 × 3.94)	
Wheel	Wheel size	mm (in.)	ø405 × ø127 (ø15.94 × ø5.00)	ø510 × ø203.2 (ø20.08 × ø8.00)
	Max width	mm (in.)	75 (2.95)	
	Grinding wheel speed	m/min (fpm)	2,700 [3,600] (8,859 [11,812])	
Wheelhead (X-axis)	Travel	mm (in.)	325 (12.8)	
	Automatic cutting speed	mm/min (ipm)	ø0.0012 to ø6,000 (ø0.00004 to ø236.22)	
	Positioning speed	m/min (fpm)	ø30 (ø98)	
	Min command increment	mm (in.)	ø0.0001 (ø0.000004)	
Saddle (Z-axis)	Travel	mm (in.)	GP: 395 (15.55) GA: 440 (17.32)	
	Automatic cutting speed	mm/min (ipm)	0.0006 to 6,000 (0.00002 to 236.22)	
	Positioning speed	mm/min (ipm)	20,000 (787.40)	
	Min command increment	mm (in.)	0.0001 (0.000004)	
Workhead	Tapered bore		MT No.3 [Dead center workhead, Dead/live headstock] MT No.4 [Chucking headstock]	
	Speed	min^{-1}	Max 1,000	
	No. of speed steps		Infinitely variable	
Tailstock	Tapered bore		MT.No.3	
	Working travel	mm (in.)	35 [50] (1.38 [1.97])	
	Manual taper offset	mm (in.)	±ø0.08 (±ø0.003)	
Motors	Grinding wheel axis	kW (hp)	5.5 [7.5] (7.5 [10])	
	For headstock (C axis)	kW (hp)	1.7 (2.27)	
	For wheelhead (X axis)	kW (hp)	2.2 (3)	
	For saddle (Z axis)	kW (hp)	2.2 (3)	
	For coolant pump	kW (hp)	50Hz: 0.39 (0.52) 60Hz: 0.62 (0.83)	
	Hydralic oil-lube pump	kW (hp)	1.5 (2.0)	
	For wheel spindle lubricating oil	kW (hp)	0.075 (0.1)	
	For slideway lubricating oil	kW (hp)	0.017 (0.02)	
Tank capacity	Coolant tank	L (gal)	200 (52.8)	
	Hydralic oil-lube tank	L (gal)	20 (5.28)	
	Wheel spindle lube tank	L (gal)	14 (3.7)	
	Slideway lubricant tank	L (gal)	4.2 (1.1)	
Weight		kg (lb)	4,000 (8,800)	
CNC			OSP-P300GA	

[ ]: Optional

Standard Specifications

Specifications	Description
Workhead	Dead center workhead (Std: C type) MT No.3
	Chucking headstock (T specs standard) MT No.4
	Dead/live headstock (CT specs standard) MT No.3
Tailstock	Tailstock MT No.3 Tailstock quill stroke 35 mm
Wheelhead	Wheel spindle motor: 5.5 kW (7.5 hp) (inverter drive)
Coolant nozzle	For 75 mm (2.95 in.) width
Full enclosure shielding	Manual open / close front door
Work lamp	Waterproof LED light
Dresser	Attached to workhead rear
Center remover	
Hand tools	Wrenches, toolbox

Optional Accessories

Coolant related	Coolant separator	
	Magnetic separator Enhanced type	Select for weakly magnetic alloy steel (SKD, SCM materials, etc)
	Magnet/paper filter combined system	Select to trap non-magnetic material such as abrasive grain
	Cyclone (centrifugal separation) system	Select for combined use with a magnetic separator, to discharge sludge of 11 µm Environmentally friendly without use of paper
	Increased coolant specification 300 L	Select when machining many workpieces Select to reduce frequency of coolant refilling due to evaporation, etc, and to limit the proportion of coolant with temperature rise
	Coolant auto regulator	Select when controlling coolant temperature
	Coolant supply to sizer	Used to counter thermal deformation in sizing equipment
	Bottom nozzle *	Coolant is discharged at grinding point from below to prevent grinding burn on axial face when grinding large axial faces
Measurement related	Auto direct sizer	
	w/o notch	This device measures grinding diameter during grinding and manages dimensions.
	w/ notch	Select when there are keyways and other notches in measurement location. Finger is special
	NC locator	Compensates for variation in workpiece length position
	Wheelhead attachment *	Detects workpiece axial face position by movement of wheelhead on X, Z axes (Metrol E2A, Marpos T25G can be selected)
	Table attachment *	Measures axial face position with measuring device mounted on table top
Grinding wheel trueing Device related	Diamond tool	This is a tool to form the grinding wheel and perform dressing
	D-6	Thanks to wedge form, diamond tends not to lose its shape
	LL type	Embedded Prismatic diamond means little change in cutting ability from diamond wear
	Rotary dressing	Useful in mass-production machining because of low diamond wear. Required when using CBN grinding wheel
Tailstock related	NC Tailstock MT No.5 **	170 mm travel. Select to use with workpieces of different lengths without changing tailstock position
	Carbide-tipped center	
	Standard type	Select MT No. 3, No. 4, or No. 5 to match headstock and tailstock
	Long type	Use when grinding wheel interferes with headstock or tailstock Select MT No. 3, No. 4, or No. 5 to match headstock and tailstock
	Half type	Select when there is cutting in half of center, and grinding the outside diameter near the center Select MT No. 3 or No. 5 to match tailstock
	Umbrella type MT No. 3	
	Center hole lube supplier *	Oil supplied automatically to the center hole. Lubrication uses coolant stock solution
	Center with oil supply groove	Center needed to use center hole oil supplier
	Spindle side, tailstock side	Center with hole for oil supply to inhibit heat and friction of center from friction between workpiece and center
	Center washing *	Washes off sludge attached to center exterior on spindle side and tailstock side
Drive related	Chucking headstock MT No. 4	Select when center is live (center turns). Select for regular power chucks and collet chucks. However, cam lock and nipper chuck centers are dead
	Workpiece drive	
	Dog	Workpiece is mounted by tightening bolts, and is hooked on pin in V section to rotate (manual machines only)
	Automatic dog	Dog with which one touch mounting and dismounting is possible
	Cam lock chuck	Clamping force is produced by rotation of workpiece with wedge-shaped jaws, and unclamping is done with hydraulic piping.
	Nipper chuck	
Other	Work rest	Select when grinding sections with places that use work rest
	Auto-follow auxiliary wheel guard *	Maintains safe state even if grinding wheel becomes smaller with dressing, while also preventing machining defects from forgetting to adjust coolant nozzle.
	Wheel auto balancer	When there is an imbalance in the grinding wheel and wheel flange, sensors installed on rear part of grinding wheel spindle sense vibration and the position of weights inside the balancer is modified automatically to correct balance
	Wheel balancing stand	Required in order to use balancing arbor in adjusting static balance of grinding wheel
	Balancing arbor	Used when mounting on wheel flange to adjust static balance
	Wheel flange	Adaptor for grinding wheel and grinding wheel spindle
	Wheel jib crane	Used when changing grinding wheel. Weights up to 220 kg can be suspended
	Auto wheel shutter *	Prevents contact between grinding wheel and operator during operation
	Auto open/close ceiling cover *	Manual button, cycle continuous
	Workpiece seating confirmation *	Air system
	Workpiece air blower *	To shut off water
	Spindle orientation	
	Air control unit	
	Workpiece ejector	
	Tailstock quill interlock type	
	Independent hydraulic piping drive system type	
	Workpiece holder (stand)	
	Fixed type V block change system	Decided shaft workpiece is placed on V block and clamping and unclamping is done
	Adjustment system	Workpiece holder with high general versatility is applied for adjustment of holder diameter in ø10 mm to ø150 mm range when there are various workpiece diameters
	Spare belt	
	Headstock	Workpiece X-axis motor and spare continuous use belt
	Wheelhead	Grinding wheel spindle motor and spare continuous use belt
	Mist collector	Mist collector for mist accumulated in machine
	Grinding wheel spindle	7.5 kW
	Grinding wheel speed	
	60 m/sec	High-speed specs
	Oil temperature regulator	Used in managing temperature of hydraulic unit and lubricating oil. Installation recommended in cold climates
	Distance collar	Used when combining 2 or more grinding wheels

* Separate air control unit required when selected.

** Full-enclosure shielding instead of dedicated cover.

The Next-Generation Intelligent CNC

OSP suite OSP-P300GA

With revamped operation and responsiveness— ease of use for machine shops first!

Smart factories implement advanced digitization and networking (IoT) in "Monozukuri," (manufacturing) achieving enhanced productivity and added value.
The OSP has evolved tremendously as CNC control suited to advanced intelligent technology. Okuma's new control uses the latest CPUs for a tremendous boost in operability, rendering performance, and processing speed.
The OSP suite also features a full range of useful apps that could only come from a machine-tool manufacturer, making smart manufacturing a reality.

Smooth, comfortable operation with the feeling of using a smart phone

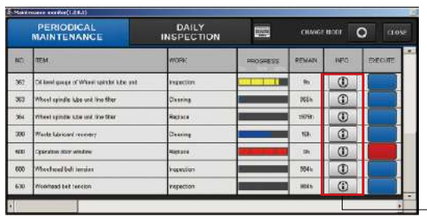
Improved rendering performance and use of a multi-touch panel achieve intuitive graphical operation. Enlarged instruction manual display and displays of tool data, programs and other lists can be done smoothly and easily with smart phone-like operations.
The screen display layout on the operation screen can also be changed to suit operator tastes, and customized for needs from beginning to veteran operator.

Features you wanted – loaded with OSP suite apps!

We made these real through the addition of Okuma's machining expertise based on requests we heard from customers in the machine shop. These are filled with intelligence that enhances the "strength in the field" that CNC control can accomplish because it's created by a machine-tool manufacturer.

Routine inspection support
Maintenance Monitor

The Maintenance Monitor displays items for inspections before starting daily operation and regular inspections and the rough estimate of inspection timing. Touching the [INFO] button displays the PDF instruction manual file of relevant maintenance items.



[INFO] button

Increased productivity through visualization of motor power reserve
Wheel Spindle Monitor

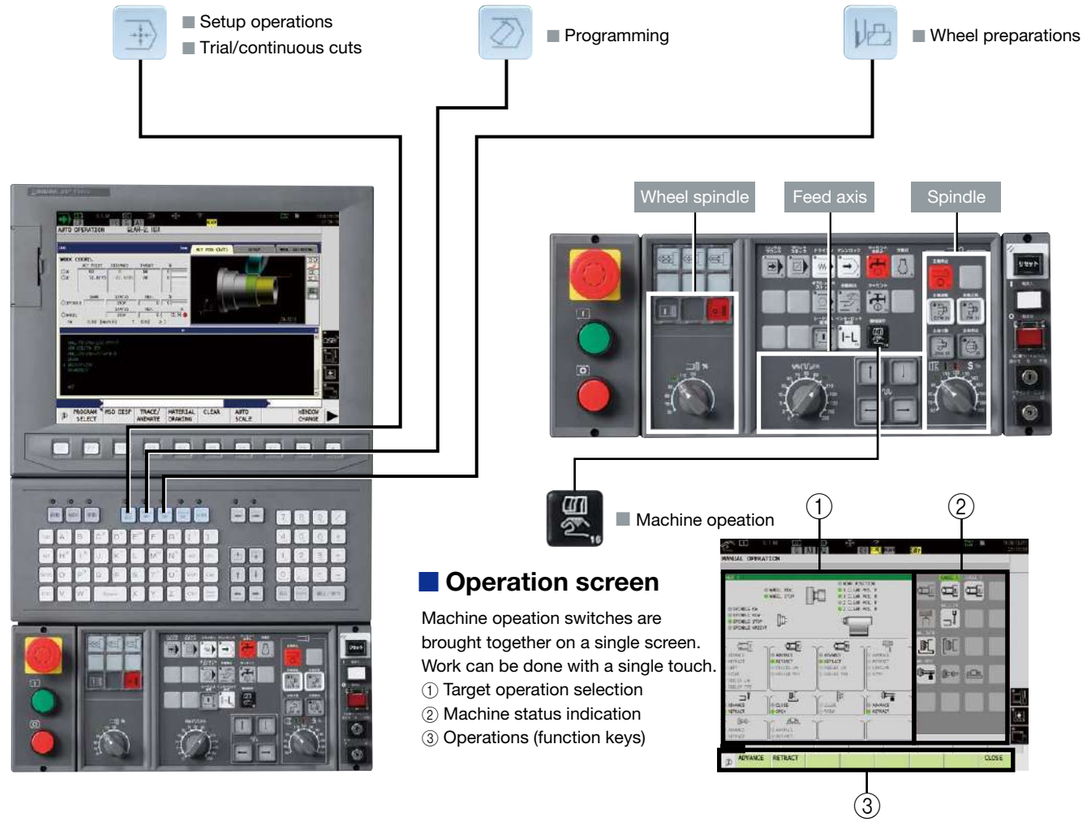
Monitoring utilization status even when away from the machine
E-mail Notification

Comment display for greater ease of use and faster work
Common Variable Monitor

Automatic saving of recorded alarms
Screen Capture

Easy programing without keying in code
Scheduled Program Editor

Easy Operation . . .
Do and see the things you want quickly and without difficulty



Operation screen

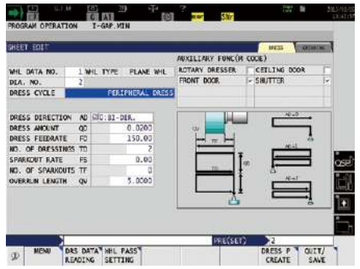
Machine opeation switches are brought together on a single screen. Work can be done with a single touch.
① Target operation selection
② Machine status indication
③ Operations (function keys)

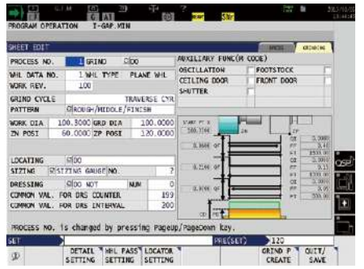
I-GAP+ (Optional)

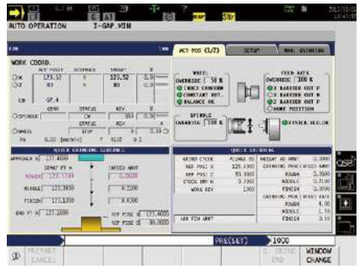
Intuitive machining operations are made possible with advances in interactive program creation and efficient creation of part programs.

Sheet programming
With screen input of grinding conditions, the wheel runout, wheel dressing, and grinding programs needed for grinding can be created without regard to GM codes.

Quick grinding
Grinding can be done while checking the cycle being executed and position on the drawings. This is Easy Operation that feels like manual operation, from roughing to finishing, by simply setting the infeed amount.

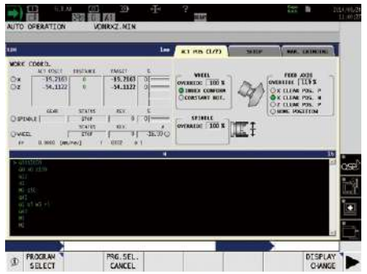

Wheel dressing program create sheet


Grinding program create sheet


Quick grinding

Running screen indications

Automatic operations and setup work are done from the running screen. Press the “Running screen” key on the operation panel or the Auto/MDI mode key to display the running screen. You can switch to the actual position sheet, setup settings sheet, or manual grinding sheet as needed.

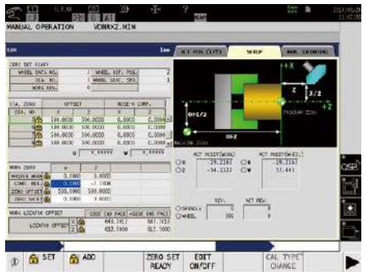


Actual position sheet (program selection)

On the actual position sheet of the running screen, in addition to actual position display, workpiece selection/program selection/schedule selection are possible with use of the function keys.

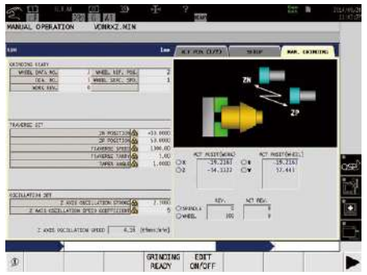
Setup settings sheet

On the setup settings sheet on the running screen, guideways, various coordinate values, and other settings for different purposes are displayed. To minimize switching between screens, settings for running conditions selection/diagram zero point/zero point shift/workpiece locator offset can be made.



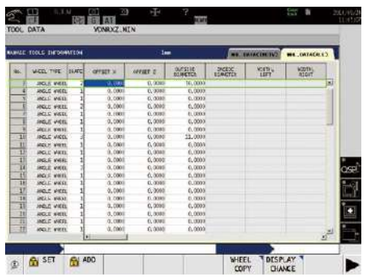
Manual grinding sheet

On the manual grinding sheet on the running screen, setting parameters for the grinding wheel and spindle speed used, traverse running, and oscillation operation are displayed. To minimize switching between screens, operation and setting items related to manual operation are brought together on a single screen.

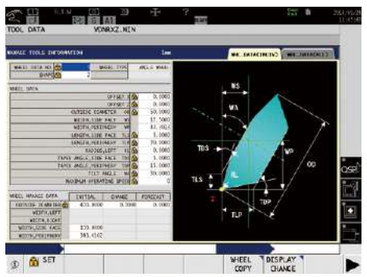


Tool data setting

Grinding wheel data are managed in the tool data settings. Grinding wheel data are displayed by pressing the “tool data setting” button on the operation panel. The setting screen shows a list of registered grinding wheel data and individual screens related to each grinding wheel.



Sheet switch



Standard Specifications

Basic Specs	Control	Simultaneous X, Z axis: 2 axes, 2 linear axes
	Spindle control	BL motor spindle, S command 4-digit, constant speed, override 50 to 200%
	Grinding wheel spindle	Grinding wheel axis (interver control), Spindle speed (G99 mode), SW command 6-digit, peripheral speed command (G98 mode), SW command 6-digit, Grinding wheel speed function (G98), Grinding wheel axis override 50 to 120%, Maximum spindle speed setting (G50), maximum peripheral speed setting (G50)
	Position feedback	OSP full range absolute position detection
	Feed drives	Override switch 0 to 200% 15 steps
	Max/Min input	Decimal 8 digits, ±9999.9999 mm (±393.70078 in.), 0.0001 mm (0.1 μm)
Display / operating functions	Display	15-inch color LCD + multi touch panel operations
	“suite” apps	Applications to visualize and digitize information needed on the shop floor
	“suite” operation	Highly reliable touch panel suited to shop floors. One-touch access to suite apps.
	Easy Operation	Single screen operations
	Data setting function	Zero point offset, wheel, wheel management, diamond tool, software limits, chuck barriers, etc
	Program editing	Program one-touch editing, workpiece selection, sequence number arrange, WIN app editing
	Operations	Workpiece selection (index program), sequence restart, Manual interrupt, PLC monitor, parameter input/output
	Programming	Linear/circular interpolation, Workpiece coordinates (G11 X axis, Z axis) / Grinding wheel coordinates (G12 U axis, W axis), Grinding wheel data 80 sets, Diamond data 9 sets, Diamond data calculation command Fixed grinding cycle, Fixed wheel dressing cycle, Programming using both mm/rev and mm/min user task 1, Zero shift, Home position function
	Program capacity	Program storage: 2 GB, operation buffer: 2 MB
	Machining management	Display of results for each machining program, display of operation results (power ON time, cutting time, etc.), input of reasons for non-operation
	Monitoring	Grinding load display, Grinding overload detection, Gap elimination function
Communications / Networking		Ethernet (1000 Mbps), USB (2 ports)
High speed/accuracy specs		Hi-G control, Droop control, Variable lost motion compensation
Online help		Programming help, Alarm help, Operation help

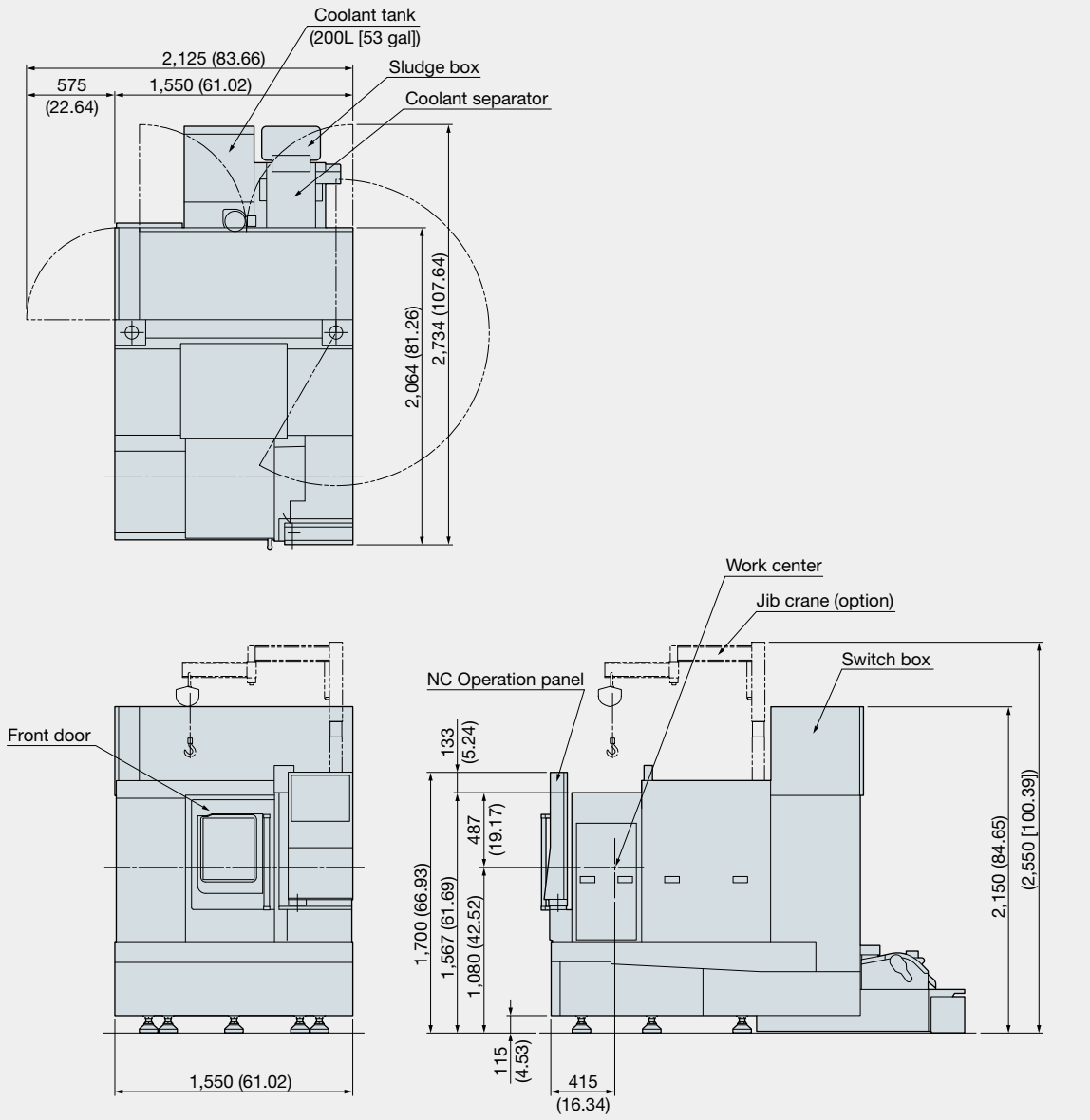
Optional Specifications

Items	Kit Specs *	NML E	NML D	3D E	3D D	I-GAP E	I-GAP D
Interactive operation							
I-GAP+						●	●
Programming							
Inch/metric switchable							
User task 2	Sub programs Calculation function operations	●	●	●	●	●	●
	With I/O terminals						
Common variables Standard 200 sets	1,000 sets						
Programmable notes			●		●		●
Monitoring							
Real 3D Simulation				●	●	●	●
3-step status indicator lamp	Type B						
	Type C	●	●	●	●	●	●
Operation end lamp	Yellow revolving light						
Alarm lamp	Red revolving light						
NC operation monitor		●	●	●	●	●	●
Work counter	4-digit resettable						
	6-digit resettable or not						
Hour meters	Power ON, resettable						
	Spindle ON, resettable or not						
	Auto operation ON, resettable or not						
Displays wheel change indication		●	●	●	●	●	●
Cycle time over check		●	●	●	●	●	●
Displays wheel change warning		●	●	●	●	●	●
Measuring							
Locator	Wheelhead mounted						
	Table mounted						

* NML: normal, 3D: 3D simulation, E: economy, D: deluxe

Items	Kit Specs *	NML E	NML D	3D E	3D D	I-GAP E	I-GAP D
External input/output communication							
RS232C connector							
DNC link	DNC-T1	●	●	●	●	●	●
	DNC-T3						
Additional USB	2 additional ports possible						
Automated functions							
Oriented spindle stop	Electric						
	Proximity SW						
Auto power shutoff	Machining completion, alarm						
	Above + external command						
Warm-up							
External workpiece selection	Rotary switch 8 types						
	Digital switch 99 types						
	External command BCD 2-digit						
	External command BCD 4-digit						
Okuma robot, loader I/F (built-in)							
Okuma robot, loader I/F (independent)							
Other manufacturers’ robot, loader I/F	Okuma standard; B specs						
	Okuma standard; C specs						
	User designation						
Dressing during loading							
Cycle time reduction		●	●	●	●	●	●
Other functions							
Control cabinet power socket							
Control cabinet lighting							
Earth leakage circuit breaker (ELCB)							
Spare M code	2 sets						
	4 sets						
Chuck/tailstock quill can be operated during program stop							
Auto grinding wheel straightening		●	●	●	●	●	●
Emergency return		●	●	●	●	●	●
OSP-VPS (OSP Virus Protection System)							

GP/GA14/15W
Dimensional Drawing



Unit: mm (in.)

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Pub.No.GP/GA14/15W-E-(3a)-150 (Feb 2018)