OKUMA

OPEN POSSIBILITIES

# GP-N Series

## GP-47N/GP-57N/GP-67N

Large CNC Cylindrical Grinders

# GP-N Series

**Large CNC Cylindrical Grinders**

## GP-47N/GP-57N/GP-67N

# Highly efficient and accurate OD grinding of big shafts up to 3,150 mm (124.02 in) long

### Highly rigid and accurate

- Non-round plain bearing wheel spindles for both heavy grinding and high accuracy jobs
- Highly efficient grinding maintained by a wide V–Flat guideway

### Built to handle large parts

- 3,150 mm long and weighing up to 1,800 kg (3,960 lb) possible (GP-67N)

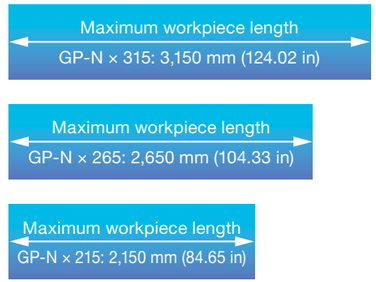
### Safe working environment

- Full-enclosure shielding also reduces the spread of grinding mist
- Wheel safety guard catches broken wheel fragments

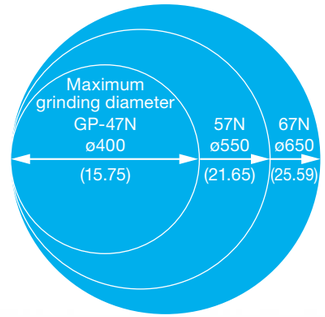
### Excellent operability

- Easy Operation provided by OSP-P300GA

■ Maximum workpiece length




■ Maximum grinding diameter

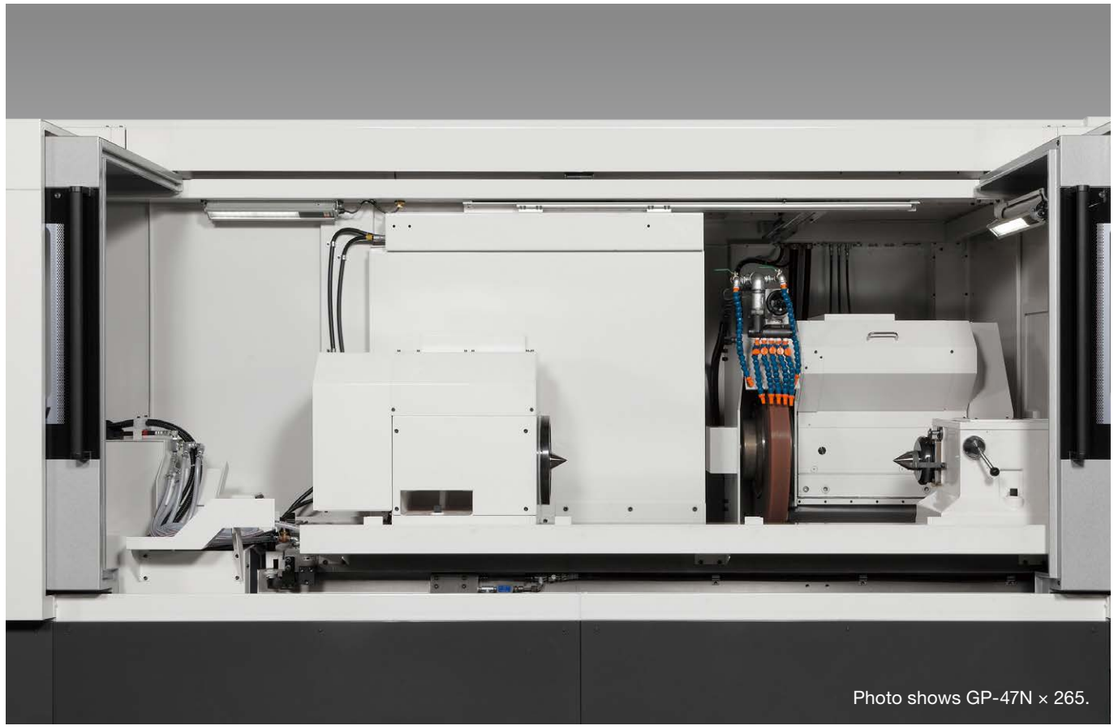



Unit: mm (in)


GP-47N × 265

Photographs used in this brochure may show optional equipment.

# Highly efficient and accurate grinding of large parts

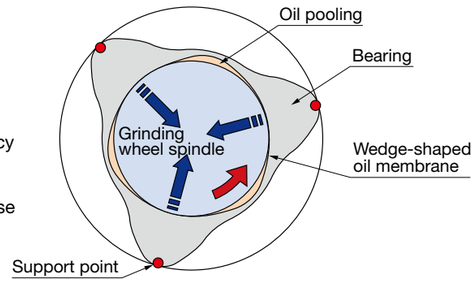



The full enclosure shielding with ceiling is designed for health and safety, while providing plenty of opening width for excellent workability.

## Hydrodynamic wheel spindle provides for heavy-duty and highly accurate grinding—with shorter cycle times

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 (0.4 µin) 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.



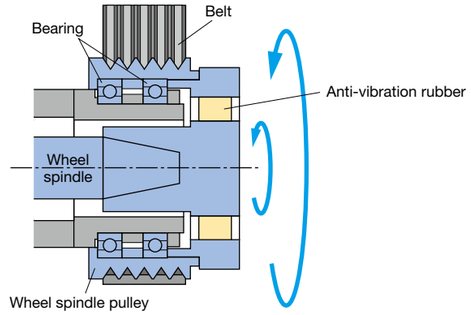

Stress analysis with FEM analysis



## Suppressing chatter

Highly accurate components (equivalent to V-3 low vibration) are used for motors and other sources of vibration (wheel/headstock spindles). Moreover, the wheel spindle pulley is a floating structure supported by bearings and anti-vibration rubber, so the grinding wheel is not affected by belt vibration.

The wheel spindle speed is automatically changed to suppress regenerative chatter and maintain stable grinding.




Floating structure

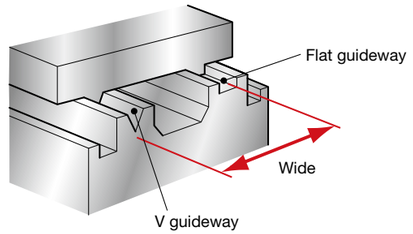
## Easy grinding condition setting

The wheel spindle uses an inverter for infinitely variable spindle speeds, and a wide range of grinding conditions can be set for roughing-to-finishing jobs.

## High machining efficiency maintained with wide V—Flat guideway

A wider V—Flat span is used between the guideways. Higher workpiece support rigidity enables grinding with full power of 15 kW (20 hp). The grinding load during heavy-duty grinding is supported by a wide V—Flat guideway design for high machining efficiency.

<Table/wheelhead guideways>



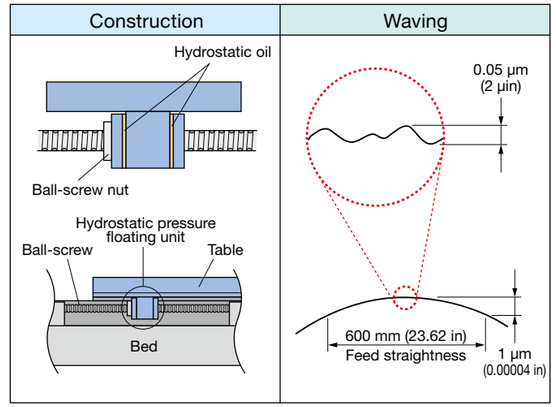

## Ensuring a safe working environment with full-enclosure shielding and wheel safety guard

Full-enclosure shielding improves machine shop environments by preventing operator contact with moving grinder components, reduces noise and prevents the spread of coolant mist.

The wheel safety guard prevents accidental contact with a continually rotating wheel after opening the door, and catches damaged wheel fragments during idling, ensuring operator safety.

## Guideway and feed motion consolidated by highly accurate technology

- Wheelhead ... hydrostatic guideway, table ... low-friction sliding material, and low-friction guideway: achieve 0.01 µm/sec (0.4 µin/sec) super-slow feed
- Excellent table straightness: 1 µm/600 mm
- A ball-screw nut is fixed to the hydrostatic pressure floating unit to eliminate adverse effects on the grinding surface due to ball-screw wavelike motion. (For both X- and Z-axes)




Note: The data shown above are actual measurements; not guaranteed values.

## Machine Specifications

| Items | | Unit | GP-47N | | | GP-57N | | | GP-67N | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | × 215 | × 265 | × 315 | × 215 | × 265 | × 315 | × 215 | × 265 | × 315 |
| Distance between centers | | mm (in) | 2,150 (84.65) | 2,650 (104.33) | 3,150 (124.02) | 2,150 (84.65) | 2,650 (104.33) | 3,150 (124.02) | 2,150 (84.65) | 2,650 (104.33) | 3,150 (124.02) |
| Swing over table | | mm (in) | ø430 (16.93) | | | ø580 (22.83) | | | ø680 (26.77) | | |
| Max grinding dia | | mm (in) | ø400 (15.75) | | | ø550 (21.65) | | | ø650 (25.59) | | |
| Max workpiece mass | Center supported | kg (lb) | 1,500 (3,300) | | | | | | 1,800 (3,960) | | |
| Wheel | Wheel size | mm (in) | ø760 × ø304.8 (ø29.92 × ø12) | | | | | | | | |
| | Width | mm (in) | 130 (5.12) | | | | | | | | |
| | No. of speed ranges | | Infinitely variable | | | | | | | | |
| | Grinding speed | m/min (fpm) | 1,200 to 2,000 (3,937.2 to 6,562) | | | | | | | | |
| Wheelhead (X-axis) | Travel | mm (in) | 475 (18.70) | | | | | | | | |
| | Auto infeed speed | mm/min (ipm) | ø0.0012 to ø6,000 (ø0.0000472 to 236.2) | | | | | | | | |
| | Rapid traverse | m/min (fpm) | ø12 (ø39.37) | | | | | | | | |
| | Min command increment | mm (in) | ø0.0001 (ø0.000004) | | | | | | | | |
| Table (Z-axis) | Travel | mm (in) | 2,430 (95.67) | 2,930 (115.35) | 3,430 (135.04) | 2,430 (95.67) | 2,930 (115.35) | 3,430 (135.04) | 2,430 (95.67) | 2,930 (115.35) | 3,430 (135.04) |
| | Auto infeed speed | mm/min (ipm) | 0 to 5,000 (0 to 196.85) | | | | | | | | |
| | Rapid traverse | m/min (fpm) | 10 (32.81) | | | | | | | | |
| | Min command increment | mm (in) | 0.001 (0.00004) | | | | | | | | |
| Workhead | Tapered bore | | MT No. 6 | | | | | | | | |
| | Spindle speed | $min^{-1}$ | 5 to 150 | | | | | | | | |
| | No. of speed ranges | | Infinitely variable | | | | | | | | |
| Tailstock | Tapered bore | | MT No. 6 | | | | | | | | |
| | Manual travel | mm (in) | 65 (2.56) | | | | | | | | |
| Motors | Wheel spindle | kW (hp) | 15 (20) | | | | | | | | |
| | Workhead | kW (hp) | 4.2 (5.6) | | | | | | | | |
| | Wheelhead feed | kW (hp) | 2.9 (3.9) | | | | | | | | |
| | Table feed | kW (hp) | 4.2 (5.6) | | | | | | | | |
| | Coolant pump | kW (hp) | 0.4 (1/2) | | | | | | | | |
| | Hydraulic oil pump | kW (hp) | 0.75 (1) | | | | | | | | |
| | Hydrostatic oil pump | kW (hp) | 0.75 (1) | | | | | | | | |
| | Wheel guard hyd pump | kW (hp) | 1.5 (2) | | | | | | | | |
| | Wheel spindle lube pump | kW (hp) | 0.075 (0.1) | | | | | | | | |
| | Coolant separator | kW (hp) | 0.025 (0.03) | | | | | | | | |
| Tank capacity | Coolant | L (gal) | 300 (79.26) | | | | | | | | |
| | Hydraulic oil | L (gal) | 40 (10.57) | | | | | | | | |
| | Hydrostatic oil | L (gal) | 40 (10.57) | | | | | | | | |
| | Wheel guard oil | L (gal) | 20 (5.28) | | | | | | | | |
| | Wheel spindle oil-lube | L (gal) | 20 (5.28) | | | | | | | | |
| Mass | | kg (lb) | 13,000 (28,600) | 14,000 (30,800) | 15,000 (33,000) | 14,000 (30,800) | 15,000 (33,000) | 16,000 (35,200) | 14,500 (31,900) | 15,500 (34,100) | 16,500 (36,300) |
| Controller | | | OSP-P300GA | | | | | | | | |

## Standard Specifications

| Specifications | Description |
|---|---|
| Workhead | Dead center workhead MT No. 6 |
| Tailstock | MT No. 6　Tailstock quill stroke 65 mm (2.56 in) |
| Wheelhead | Wheel spindle motor:  15 kW (20 hp) (inverter drive) |
| Coolant nozzle | For 75 mm (2.95 in) width |
| Work lamp | Waterproof LED light |
| Wheel dresser | Headstock rear and table top (1 each) |
| Center remover | |
| Balancing arbor | Used when mounting on wheel flange to adjust static balance |
| Hand tools | Wrenches, toolbox |



## Optional Specifications/Accessories

| | | |
|---|---|---|
| Coolant related | Coolant tank | 300 L (79.26 gal) (separately mounted) |
| | Coolant separator | |
| | Magnetic | 120 L/min (31.70 gpm) (Sumitomo Heavy Industries Finetech) |
| | 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　(Ex: FP-18 processor: 180 L/min (47.56 gpm)) |
| | Cyclone (centrifugal separation) system | Select for combined use with a magnetic separator, to discharge sludge of 11 µm (0.00043 in)<br>Environmentally friendly without use of paper |
| | 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 | This device measures grinding diameter during grinding |
| | w/o notch | For continuous surface measurement |
| | 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 ⁎ | Workpiece end face position detected by table Z-axis operation (Marpos T25G). |
| Grinding wheel trueing device related | Diamond tool | This is a tool to form the grinding wheel and perform dressing |
| | D-5 | 2ct |
| | 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 | Auto tailstock | Hydraulic pressure advances the sleeve and spring pressure supports the workpiece. |
| | Carbide-tipped center | |
| | Standard type | Select MT No. 6 to match headstock and tailstock |
| | Long type | Use when grinding wheel interferes with headstock or tailstock. Select MT No. 6 to match headstock and tailstock |
| | Half type | Select when there is cutting in half of center, and grinding the outside diameter near the center<br>Select MT No. 6 to match tailstock |
| | Umbrella type MT No. 6 | |
| | 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. 6 | Select when center is live (center turns). |
| | Workpiece drive | |
| | Dog | Workpiece is mounted by tightening bolts, and is hooked on pin in V section to rotate<br>ø20 (0.79) to 25 (0.98), ø25 to 30 (1.18), ø30 to 35 (1.38), ø35 to 50 (1.97), ø50 to 70 (2.76), ø70 to 90 (3.54),<br>ø90 to 110 (4.33), ø110 to 130 (5.12), ø130 to 150 (5.91), ø150 to 200 (7.87) mm (in) |
| | Automatic dog | Dog with which one touch mounting and dismounting is possible<br>ø6 (0.24) to 14 (0.55), ø13 (0.51) to 24 (0.94), ø20 (0.79) to 34 (1.34), ø31 (1.22) to 42 (1.65),<br>ø40 (1.57) to 60 (2.36), ø60 to 80 (3.15), ø80 to 100 (3.94) mm (in) |
| Shielding | Full enclosure shielding ★ | Manual open / close front door |
| Other | Work rest | Used to suppress workpiece bending due to the grinding force. |
| | 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 |
| | Wheel flange | Adapter for attaching grinding wheel to wheel spindle (35 to 130 mm (1.38 to 5.12 in) wheel widths) |
| | Wheel change jib crane | Used when changing grinding wheel. Weights up to 340 kg (748 lb) can be suspended |
| | Wheel safety guard ◆ | Prevents contact between grinding wheel and operator during operation |
| | Auto open/close ceiling cover ⁎ | Manual button, cycle continuous |
| | Spindle orientation | Proximity switch |
| | 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 | Highly versatile workpiece holder with adjustable diameters (ø10 (0.39) to 150 (5.91) and ø100 (3.94) to 250 (9.84) mm (in) ranges) for high-mix applications. |
| | Spare belt | |
| | Headstock | Workpiece 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 motor | 22 kW (30 hp) |
| | Oil temperature regulator | To regulate hydraulic and lube oil temperatures. Installation recommended in cold climates |
| | Distance collar | Used when combining 2 or more grinding wheels |

⁎ Separate air control unit required when selected.
★ A required option.
◆ Required option for certain destinations.

# OSP suite OSP-P300GA

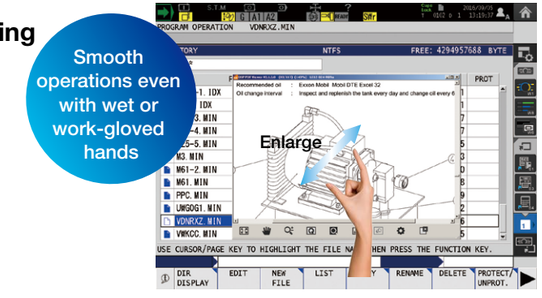
The Next-Generation Intelligent CNC

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

Smart factories are using advanced digitization and networking (IIoT) in manufacturing to achieve enhanced productivity and added value. The OSP has evolved tremendously as a CNC 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 smartphone

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 smartphone-like operations. The screen display layout on the operation screen can also be changed to suit operator preferences and customized for the novice and/or veteran machinists.

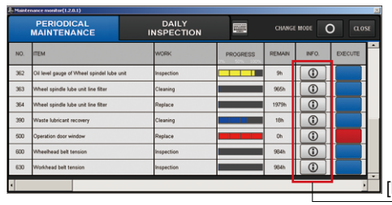



## "Just what we wanted."— Refreshed OSP suite apps

This became possible through the addition of Okuma's machining expertise based on requests we heard from real, machine-shop customers. The brain power packed into the CNC, built by a machine tool manufacturer, will "empower shop floor" management.

### Maintenance Monitor
Routine inspection support

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

### Wheel Spindle Monitor
S11
Increased productivity through visualization of motor power reserve

### E-mail Notification
S15
Monitoring operating status even when away from the machine

### Common Variable Monitor
S17
Comment display for greater ease of use and faster work

### Screen Capture
S16
Automatic saving of recorded alarms

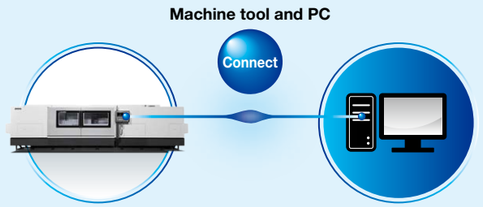
### Scheduled Program Editor
S10
Easy programming without keying in code

## Connect Plan

**Get Connected, Get Started, and Get Innovative with Okuma "*Monozukuri*"**

### Connect, Visualize, Improve

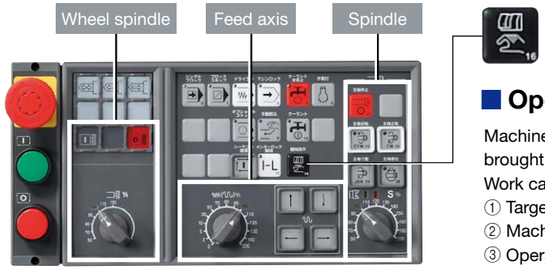
Okuma's Connect Plan is a system that provides analytics for improved utilization by connecting machine tools and visual control of factory operation results and machining records. Simply connect the OSP and a PC and install Connect Plan on the PC to see the machine operation status from the shop floor, from an office, from anywhere. The Connect Plan is an ideal solution for customers trying to raise their machine utilization.





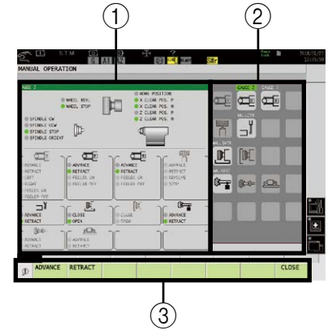

# Easy Operation . . .
# Do and see the things you want quickly and without difficulty

■ Setup operations
■ Trial/continuous cuts
■ Programming
■ Wheel preparations




## 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)

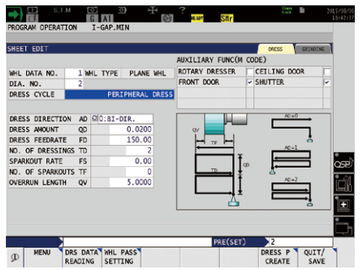



## I-GAP+ (option)

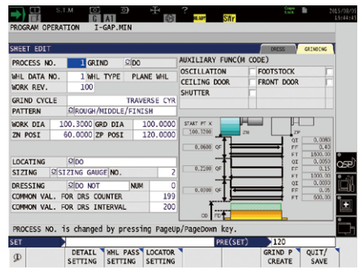
Intuitive machining operations are made possible with advances in interactive program creation and efficient creation of part programs.

- **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.

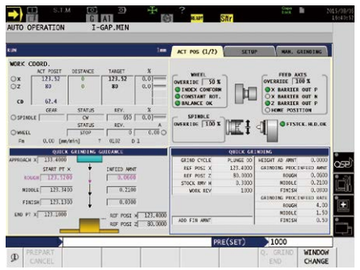
- **Quick grinding**
Grinding can be done while checking the cycle being executed and position on the drawings. This is Easy Operation that feels like manual operation, from roughing to finishing, by simply setting the infeed amount.




Wheel dressing program create sheet



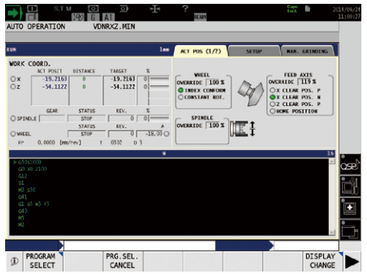

Grinding program create sheet




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)

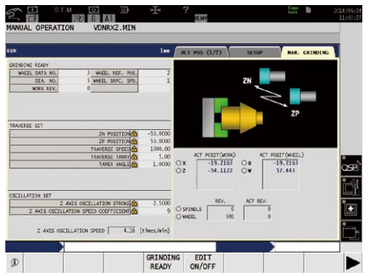
On the actual position sheet of the running screen, in addition to actual position display, workpiece selection/program selection/schedule selection are possible with use of the function keys.


## 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.

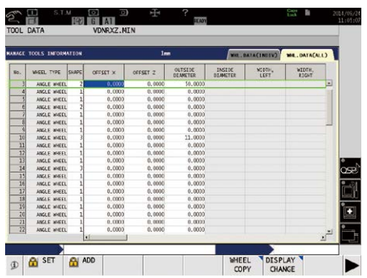

## Manual grinding sheet

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.

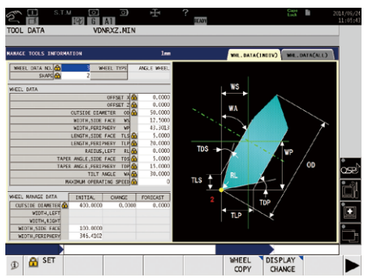



## Tool data setting

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: 4 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

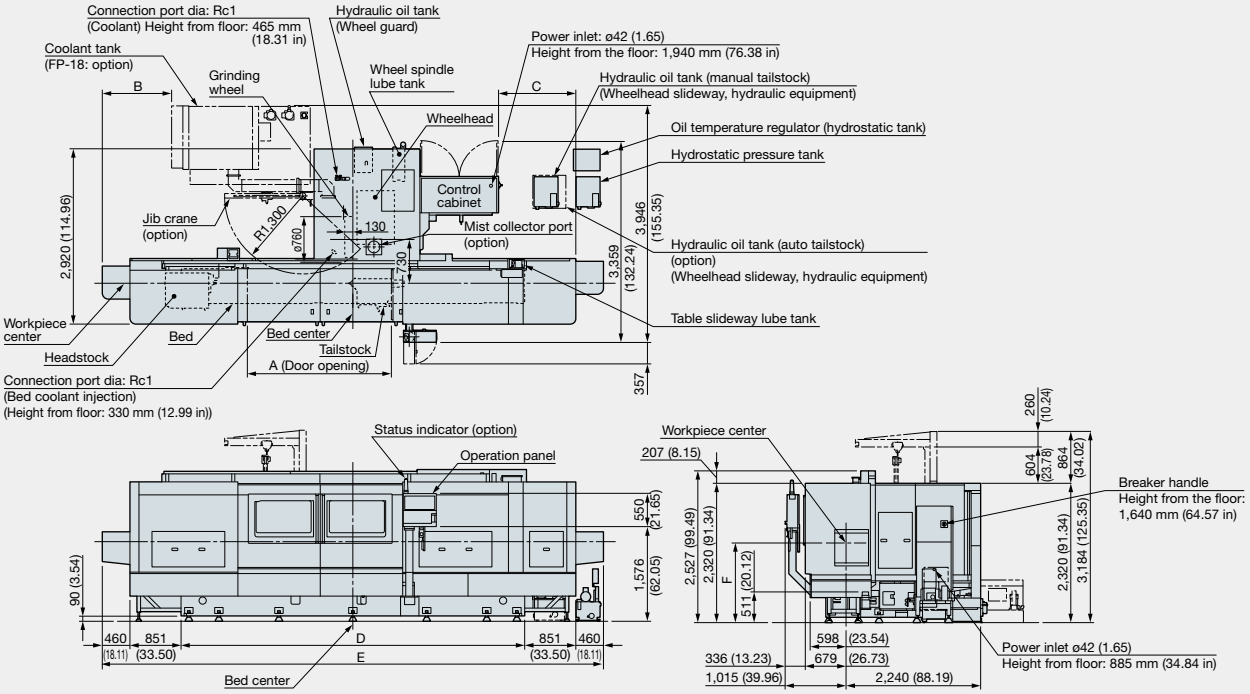
| Items | Kit Specs * | NML E | NML D | 3D E | 3D D | I-GAP E | I-GAP D |
|---|---|---|---|---|---|---|---|
| **Interactive operation** | | | | | | | |
| I-GAP+ | | | | | | ● | ● |
| **Programming** | | | | | | | |
| Inch/metric switchable | | | | | | | |
| User task 2 | Sub programs Calculation function 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** | | | | | | | |
| RS-232C 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-47N/57N/67N
## Dimensional/Installation Drawings

Unit: mm (in)
Drawings represent the 215 DBC grinder model.




| Item | | Door opening A | B | C | D | E | F | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 47N | 57N | 67N |
| Specifications | × 215 | 2,396 (94.33) | 1,154 (45.43) | 1,285 (50.59) | 5,720 (225.20) | 8,342 (328.43) | 1,250 (49.21) | 1,325 (52.17) | 1,375 (54.13) |
| | × 265 | 2,896 (114.02) | 1,654 (65.12) | 1,785 (70.28) | 6,720 (264.57) | 9,342 (367.80) | | | |
| | × 315 | 3,396 (133.70) | 2,154 (84.80) | 2,285 (89.96) | 7,720 (303.94) | 10,342 (407.17) | | | |

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Pub.No.GP-N series-E-(7a)-150 (Mar 2022)