

PALMARY PRODUCTS

- Centerless Grinder
- Cylindrical Grinder
- **INTERNAL GRINDER**
- Vertical Grinder
- Surface Grinder
- Special Purpose Grinder

 PALMARY

PALMARY

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2403N3

INTERNAL GRINDER

CNC/NC
series

 PALMARY

PALMARY

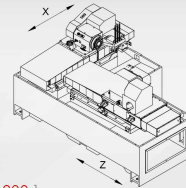


INTERNAL GRINDER

Since PALMARY established, we have always been committed to improving the grinding accuracy and developing user-friendly operation. Combining high precision, easy-to-use and long lasting stability as well as strict quality control system, the internal grinder perfect presented high-end performance.

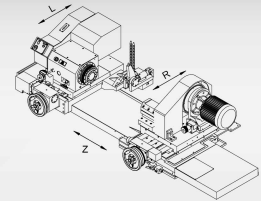
PURSUANCE OF PERFECTION
 EXTRAORDINARY DESIGN
 GUARANTEE THE BEST GRINDING ACCURACY YOU CAN FIND

2-AXIS



[OIG-200]

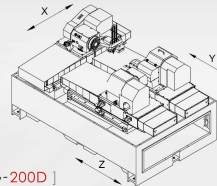
3-AXIS



3-AXIS

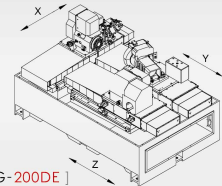
A 3-axis CNC grinder consists of X, Z, and Y axis can work with each other for powerful complex function and custom-made is available, featuring to meet high precision and high accuracy demand, saving repetitive workpiece set up and handling time.

Equipped with two internal grinding spindles, the machine is capable of grinding small hole, end face and outside diameter at one time which required high concentricity accuracy.



[OIG-200D]

Y axis equipped with outer grinding wheel allows for grinding workpiece's outer diameter or end face. All axes support each other to allow multiple processes to be accomplished in one cycle.



[OIG-200DE]

CNC series OIG



[OIG-200]
 ■ 2-AXIS CONTROL



[OIG-200D]
 ■ 3-AXIS CONTROL



[OIG-200DE]
 ■ 3-AXIS CONTROL

NC series IG



[IG-150-NC]



[IG-150-2NC]
 ■ SEMI-ENCLOSED
 SPLASH GUARD (OPT.)

CNC INTERNAL GRINDER

COMPLETE GRINDING SOLUTION IS HIGHLY EXPERIENCED AND OFFERS SERVICES TO ALL MAJOR INDUSTRIES

OIG



FEATURE

The machine bed is manufactured from high quality cast iron specially heat treated and precision machined to ensure deformation-free performance, year after year.



ELECTRICAL SYSTEM

- The control circuit meets safety regulations.
- The electrical cabinet is with dust-proof design, consists of high quality electronic components, featuring dependable control performance.
- Equipped with a heat exchanger, providing a constant temperature for the control circuit.



CNC CONTROLLER

Equipped with Graphic and Dialogue Operation Screen for easy operation and for great reduction of set up time and consequently enhance production efficiency.

OUTSTANDING FEATURES

1 SLIDES

The slides move on roller type linear guideways for increasing smoothness & stable movements.

2 WORK SPINDLE

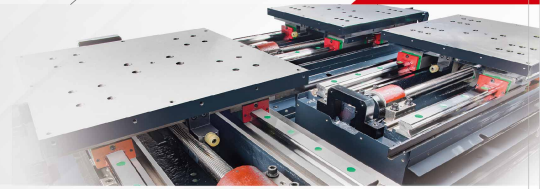
Bearing type work spindle can be used together with various jig.

3 GRINDING WHEEL SPINDLE

- Provides internal grinding spindle (Alternative 10,000 –50,000 r.p.m.)
- The internal grinding spindle is available to equip with customized wheel for grinding outer diameter or end face.

4 AUTOMATIC BELT TENSION ADJUSTMENT

Automatic belt tensioning is made by means motor self-weight and eccentric shaft, assuring full power transmission. This also avoids affection on grinding quality due to belt loosening. Frequency inverted motor permits variable speed changes to suit various workpiece materials.



OPTIONAL ACCESSORIES

LINEAR SCALE

- Equipped with linear scale to upgrade positioning accuracy.
- X axis is with linear scale (standard).
- To meet the flexible demands, Y and Z axis are available to be equipped with linear scale (opt.)

GAP CONTROL

Runs with current detection precision device to enhance the stability of grinding process, it can prevent the machine crashing caused by program errors. (For belt-driven type of spindle)

AUTO. LOADING & UNLOADING EQUIPMENT

To meet mass production requirements, automatic loading and unloading equipment is available to provide a fully automatic operation.

GEAR FIXTURE (opt.)

- A fixture specially designed for fast and convenient gear loading and unloading.
- Three-point clamping design.

Suitable for grinding, internal straight hole, end face, internal chamfering angle, internal circular angle, internal taper and internal step, etc.

GRINDING EXAMPLE				GRINDING WHEEL DRESSING CYCLE
INTERNAL BREATHING HOLE	TWO-STEP STRAIGHT HOLES	INTERNAL BREATHING HOLE + OUTER END FACE (GEAR)	INTERNAL RECESS HOLE + INTERNAL END FACE	
INTERNAL TAPER HOLE	INTERNAL RECESS HOLE + INTERNAL CHAMFERING ANGLE	INTERNAL RADIUS (R DRESSER-SPECIAL ACCESSORY)	INTERNAL BREATHING HOLE + INTERNAL CIRCULAR ANGLE	GRINDING WHEEL END FACE DRESSING

NC INTERNAL GRINDER

IG



ADVANCED NC CONTROL

- The NC controller employs conversational and operational interface. It applies words or graphics to replace the conventional lamp indication for added operational convenience.
- The conversational control provides variable speed setting and feed amount setting.
- Fully digitized machining for upgrading machining accuracy, establishing standardization and ensuring product quality.
- NC controlled automatic dressing with compensation. In case a diamond or CBN grinding wheel is applied, a selection of no dressing and compensation is available. For hard-to-grind parts, a multiple dressing and compensation mode can be selected to ensure the desired grinding quality.
- Trouble history records combined with troubleshooting instructions greatly upgrade servicing efficiency and quality.

MAXIMUM OPERATIONAL CONVENIENCE

PALMARRY technical breakthroughs - the NC series internal grinding machines. The NC controller employs conversational operational interface. All the grinding motions - from rough grinding, dressing, finish grinding to spark out - are fully automatically operated, greatly upgrades productivity. It is excellent for mass production and small quantity as well as flexible workpiece grinding that makes your internal grinding easier and more accurate.



■ BUILT-IN TYPE SPINDLE & SPINDLE COOLING DEVICE (OPT.)

■ AUTOMATIC LUBRICATION SYSTEM

The slideways are lubricated by the static pressure automatic lubrication system, thereby providing smooth movement and maximum wear resistance.



FACE GRINDING ATTACHMENT (OPT.)

The machine is available to equip with a face grinding attachment - to allow internal grinding and face grinding operations to be accomplished at one time. This assures outstanding perpendicularity accuracy while greatly upgrading efficiency.

- The face grinding attachment accommodates a common grinding wheel or a CBN grinding wheel. (opt.)
- Equipped with manual dressing device.

OUTSTANDING FEATURES

SLIDEWAY

Slideways are high frequency hardened and precision machined, providing excellent wear resistance.

SLIDE

The slide reciprocating movement is driven by a hydraulic system, providing variable speed change and superior stability.

FEED AXIS

Precision ball screw combined with servomotor drive provide variable feed speed change.

WHEEL HEAD SLIDE

Providing a selection of automatic or manual feed modes.

WORKHEAD SLIDE

- Employs Japan Mitsubishi servomotor for feed drive.
- The servomotor features compact construction, superior torque output, fast speed response, high accuracy and stability.

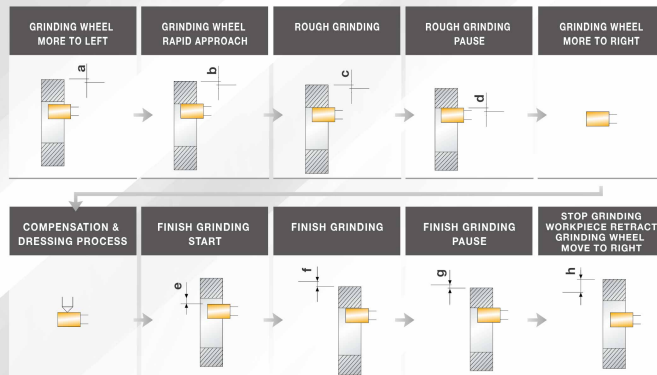


[IG-150-NC]



[IG-150-2NC]

- SEMI-ENCLOSED SPLASH GUARD (OPT.)



MACHINE SPECIFICATIONS

CNC series							
ITEM	OIG-200	OIG-200L35	OIG-200L50	OIG-200D	OIG-200DL35	OIG-200DE	OIG-200DEL35
Capacity							
Max. external grinding diameter	Ø200 mm	Ø200 mm	Ø200 mm	Ø200 mm	Ø200 mm	Ø200 mm	Ø200 mm
Max. internal grinding diameter	Ø150 mm	Ø150 mm	Ø150 mm	Ø150 mm	Ø150 mm	Ø150 mm	Ø150 mm
Max. workpiece length	200 mm	350 mm	500 mm	200 mm	350 mm	200 mm	350 mm
Internal wheel spindle (Z axis)							
Spindle outer diameter	Ø90 mm	Ø90 mm	Ø90 mm	Ø90 mm	Ø90 mm	Ø90 mm	Ø90 mm
Spindle speed	10,000 / 20,000 / 30,000 / 40,000 / 50,000 rpm			10,000 / 20,000 / 30,000 / 40,000 / 50,000 rpm		10,000 / 20,000 / 30,000 / 40,000 / 50,000 rpm	
External wheel spindle (Y axis)							
O.D. x width x I.D.	-	-	-	-	-	Ø355 x 38 x Ø127 mm	Ø355 x 38 x Ø127 mm
Linear velocity	-	-	-	-	-	30 m/s	30 m/s
Spindle speed	-	-	-	-	-	1,880 / 2,090 rpm	1,880 / 2,090 rpm
Table (X axis)							
Rapid feedrate	Ø10 m/min	Ø10 m/min	Ø10 m/min	Ø10 m/min	Ø10 m/min	Ø10 m/min	Ø10 m/min
Max. table traverse	480 mm	480 mm	480 mm	480 mm	480 mm	480 mm	480 mm
Min. setting unit	0.001 mm	0.001 mm	0.001 mm	0.001 mm	0.001 mm	0.001 mm	0.001 mm
Table (Z axis)							
Rapid feedrate	10 m/min	10 m/min	10 m/min	10 m/min	10 m/min	10 m/min	10 m/min
Max. table traverse	480 mm	450 mm	710 mm	480 mm	450 mm	450 mm	450 mm
Min. setting unit	0.001 mm	0.001 mm	0.001 mm	0.001 mm	0.001 mm	0.01 mm	0.01 mm
Table (Y axis)							
Rapid feedrate	-	-	-	10 m/min	10 m/min	10 m/min	10 m/min
Max. table traverse	-	-	-	480 mm	450 mm	310 mm	310 mm
Min. setting unit	-	-	-	0.001 mm	0.001 mm	0.01 mm	0.01 mm
Work spindle							
Workhead swivel	+7° ~ -8°	+1° ~ -1°	+1° ~ -1°	+7° ~ -8°	+1° ~ -1°	+7° ~ -8°	+1° ~ -1°
Center taper	MT 6	MT 6	MT 6	MT 6	MT 6	MT 6	MT 6
Spindle speed	0 ~ 500 / 0 ~ 800 rpm		0 ~ 500 / 0 ~ 800 rpm		0 ~ 500 / 0 ~ 800 rpm		
Max. load of spindle (tool holder included)	50 kg (mm)		50 kg (mm)		50 kg (mm)		
Motor							
Wheel spindle	2.25 kW	2.25 kW	2.25 kW	2.25 kW	2.25 kW	2.25 kW (Z axis) / 4 kW (Y axis) 2.25 kW (Z axis) / 4 kW (Y axis)	
Work spindle (AC Servo Motor)	1.5 kW	2.25 kW	2.25 kW	1.5 kW	2.25 kW	1.5 kW	2.25 kW
X axis infeed table (AC Servo Motor)	1.8 kW	1.8 kW	1.8 kW	1.8 kW	1.8 kW	1.8 kW	1.8 kW
Z axis infeed table (AC Servo Motor)	1.8 kW	1.8 kW	4.4 kW	1.8 kW	1.8 kW	1.8 kW	1.8 kW
Y axis infeed table (AC Servo Motor)	-	-	-	1.8 kW	1.8 kW	1.8 kW	1.8 kW
Hydraulic pump	0.75 kW	0.75 kW	0.75 kW	0.75 kW	0.75 kW	0.75 kW	0.75 kW
Coolant pump	0.09 kW	0.09 kW	0.09 kW	0.09 kW	0.09 kW	0.09 kW	0.09 kW
Tank							
Hydraulic tank	29 L	29 L	29 L	29 L	29 L	29 L	29 L
Coolant tank	70 L	70 L	70 L	70 L	70 L	70 L	70 L
Machine weight							
Net weight	4,700 kg	5,000 kg	5,700 kg	5,700 kg	6,000 kg	6,000 kg	6,300 kg

* The manufacturer reserves right to modify the design, specification mechanisms etc. without notice.

NC series		
ITEM	IG-150-NC	IG-150-2NC
Capacity		
Workhead cover swivelling dia.	Ø280 mm	Ø280 mm
Internal grinding range	Ø150 mm	Ø150 mm
Max. workpiece length	200 mm	200 mm
Wheel spindle		
Spindle outer diameter	Ø90 mm	Ø90 mm
Spindle speed	10,000 / 20,000 / 30,000 / 40,000 / 50,000 rpm	
Table (X axis)		
Rapid feedrate	Ø0.05 m/min	Ø0.05 m/min
Max. table traverse	60 mm	60 mm
Min. setting unit	0.001 mm	0.001 mm
Table (R axis)		
Rapid feedrate	Ø70 m/min	Ø300 m/min
Max. table traverse	70 mm	70 mm
Min. setting unit	0.001 mm	0.001 mm
Hydraulic axis / Z axis		
Rapid feedrate	7.2 m/min (Hydraulic)	40 m/min
Max. table traverse	540 mm	400 mm
Work spindle		
Workhead swivel	+7° ~ -8°	+7° ~ -8°
Center taper	MT 6	MT 6
Spindle speed	0 ~ 800 rpm	0 ~ 800 rpm
Max. load of spindle (tool holder included)	50 kg (mm)	50 kg (mm)
Motor		
Wheel spindle	2.25 kW	2.25 kW
Work spindle (AC Servo Motor)	1.5 kW	1.5 kW
X axis infeed table (AC Servo Motor)	0.4 kW	0.4 kW
R axis infeed table (AC Servo Motor)	0.4 kW	0.4 kW
Z axis infeed table (AC Servo Motor)	-	2 kW
Hydraulic pump	1.5 kW	0.75 kW
Coolant pump	0.09 kW	0.09 kW
Tank		
Hydraulic tank	85 L (Hydraulic 65 L / Lubrication 20 L)	42 L
Coolant tank	70 L	70 L
Machine weight		
Net weight	2,100 kg	2,250 kg

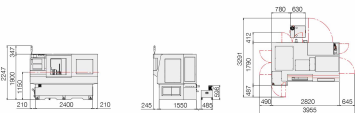
SURFACE ROUGHNESS CHART

	Ra µm	CLA µm*	Rt µm	Rz µm	RMS µm	RMS µm*	France	England SUIZE	Russia Rajum	
▽14	0.008	0.32	0.08	0.04	0.009	0.30			▽14	
	0.010	0.40	0.10	0.05	0.011	0.40				
	0.012	0.50	0.12	0.06	0.013	0.50				
	0.016	0.63	0.16	0.08	0.018	0.70				
	0.020	0.80	0.20	0.10	0.022	0.90	9	N1	▽13	
	0.025	1	0.25	0.12	0.027	1.10				
	0.030	1.20	0.30	0.15	0.033	1.30				
	0.032	1.25								
	0.040	1.60	0.40	0.20	0.044	1.80	10	N2	▽12	
	0.050	2	0.50	0.25	0.055	2.20				
▽11	0.060	2.40	0.60	0.30	0.066	2.65				
	0.063	2.50	0.63	0.32	0.073	2.87				
	0.080	3.2	0.80	0.40	0.088	3.50	11	N3	▽11	
	0.090	3.6			0.10	4.20				
	0.10	4	0.90	0.50	0.11	4.40				
	0.125	5	1.05	0.60	0.137	5.40				
	0.14	5.60								
	0.16	6.30	1.30	0.85	0.177	7	12	N4	▽10	
	0.18	7.20			0.20	8				
	0.20	8	1.60	1	0.22	8.80				
▽9	0.25	10	2	1.20	0.27	10.80				
	0.30	12	2.50	1.60	0.33	13.20				
	0.32	12.50			0.35	14	13	N5	▽9	
	0.35	14								
	0.40	16	3	2	0.44	17.60				
	0.45	18	3.50	2.25	0.50	20				
	0.50	20	4	2.50	0.55	22				
	0.63	25	5	3	0.73	28.70	14	N6	▽8	
	0.80	32			0.88	35				
	▽7	1	40							
1.25		50	10	6	1.37	54.60				
1.50		60					15	N7	▽7	
1.60		63			1.77	69.70				
1.80		72								
2		80			2.20	88				
2.50		100	15	10	2.70	108	16	N8	▽6	
3.2		125			3.55	140				
4		160			4.40	176				
5		200	30	20	5.50	220				
▽5	6	240					17	N9	▽5	
	6.30	250			7.30	287				
	8	320			8.8	350				
	10	400	50	40	11	440	18	N10	▽4	
	12.5	500			13.7	546				
	▽3	16	630			17.7	697			
		20	800	100	80	22	880	19	N11	▽3
		25	1000			27	1080			
		32	1250							
		40	1600	200	160	44	1760	20	N12	▽2
50		2000								
63		2500								
80		3200	400	320	88	3500				
100		4000								

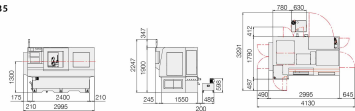
1µm = 0.001mm=39.37µ" 1µ"0.000,001=0.0254µm

MACHINE DIMENSIONS (unit: mm)

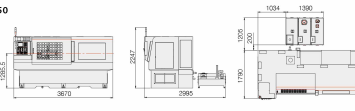
OIG-200



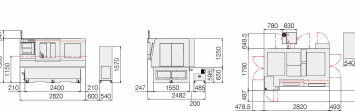
OIG-200L35



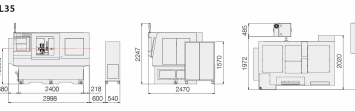
OIG-200L50



OIG-200D



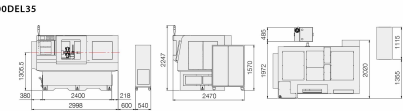
OIG-200DL35



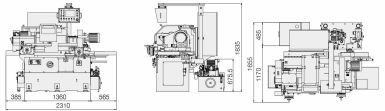
OIG-200DE



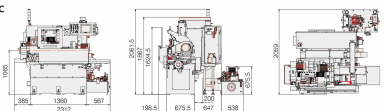
OIG-200DEL35



IG-150-NC



IG-150-2NC



STANDARD ACCESSORIES

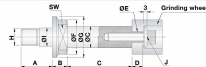
	OIG-200	OIG-200L35 OIG-200L50	OIG-200D OIG-200DL35	OIG-200DE OIG-200DEL35	IG-150-NC	IG-150-2NC
FANUC CNC controller	○	○	○	○	-	-
NC controller (PLC)	-	○	○	○	○	○
Fully enclosed splash guard	○	○	○	○	○	○
Splash cover	○	○	○	○	○	○
Grinding wheel spindle (alternative of 10000-50000 r.p.m.)	○	○	○	○ x2	○	○
External grinding wheel (with Flange)	○	○	○	○	○	○
Diamond dresser	○	○	○	○	○	○
Belt tension auto. adjustment	○	○	○	○	○	○
Linear scale (for X axis)	○	○	○	○	-	-
Hydraulic tank with pump	○	○	○	○	○	○
Coolant tank with pump	○	○	○	○	○	○
Work lamp	○	○	○	○	○	○
Tools (Leveling pad) and tool box	○	○	○	○	○	○

OPTIONAL ACCESSORIES

	OIG-200	OIG-200L35 OIG-200L50	OIG-200D OIG-200DL35	OIG-200DE OIG-200DEL35	IG-150-NC	IG-150-2NC
Adjustable 3-jaw chuck	○	○	○	○	○	○
Hydraulic 3-jaw chuck	○	○	○	○	○	○
Quick fixtures for gears	○	○	○	○	○	○
Soft jaw machining device	○	○	○	○	○	○
Spare I.D. G.W. spindle	○	○	○	○	○	○
Spare O.D. grinding wheel	○	○	○	○	○	○
Diamond roller dressing device for CBN G.W.	○	○	○	○	○	○
Face grinding unit (manual)	○	○	○	○	○	○
Rotary dressing device	○	○	○	○	○	○
Auto. gauge (internal & end face)	○	○	○	○	○	○
Linear scale (for Z axis)	○	○	○	○	-	-
Linear scale (for Y axis)	○	○	○	○	-	-
Wheelhead oil lubricator for oil mist type spindle	○	○	○	○	○	○
Magnetic coolant separator	○	○	○	○	○	○
Paper filter	○	○	○	○	○	○
Oil mist collector	○	○	○	○	○	○

INTERNAL GRINDING SPINDLE SPEED RANGE

Grinding Dia.	Grass Type	A	B	C	D	E	F	G	H	I	J	SW	Oil mist type
Ø65 - Ø150	8,000 rpm	42	16	Ø40 x 150	12	Ø12	Ø50	Ø18	M30 x 2P	Ø28	M8 x 1.25P	41	
				Ø40 x 55									
Ø40 - Ø80	10,000 rpm	29	14	Ø25 x 70	10	Ø10	Ø32	Ø18	M16 x 1.5P	Ø17	M8 x 1.25P	24	
				Ø20 x 60									
Ø35 - Ø70	15,000 rpm	29	14	Ø25 x 70	10	Ø10	Ø32	Ø18	M16 x 1.5P	Ø17	M8 x 1.25P	24	
				Ø20 x 60									
Ø24 - Ø40	20,000 rpm	28	11	Ø16 x 40	8	Ø8	Ø26	Ø32	M14 x 1.5P	Ø15	M6 x 1.0P	19	
				Ø16 x 60									
Ø15 - Ø25	30,000 rpm	21	9	Ø13 x 30	6	Ø6	Ø21	Ø26	M10 x 1.5P	Ø10.5	M4 x 0.7P	17	40,000 rpm
				Ø13 x 25									
Ø12 - Ø16	40,000 rpm	20	8	Ø10 x 30	x	x	Ø18	Ø23	M8 x 1.25P	Ø8.5	M4 x 0.7P	14	50,000 rpm
				Ø8 x 25									
Ø9 - Ø13	50,000 rpm	18	7	Ø7 x 25	x	x	Ø15	Ø20	M7 x 1P	Ø7.5	M4 x 0.7P	11	60,000 rpm
				Ø6 x 20									



NOTE: The appropriate ratio of grinding hole diameter to length is 1:3.