PROTH®

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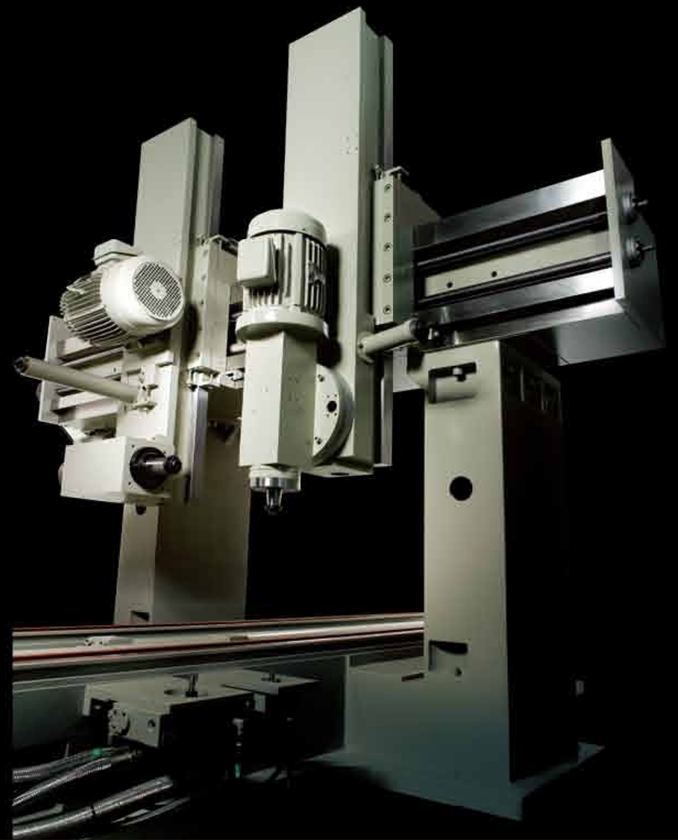


Simple is the Best

PROTH®

PRECISION SURFACE GRINDER

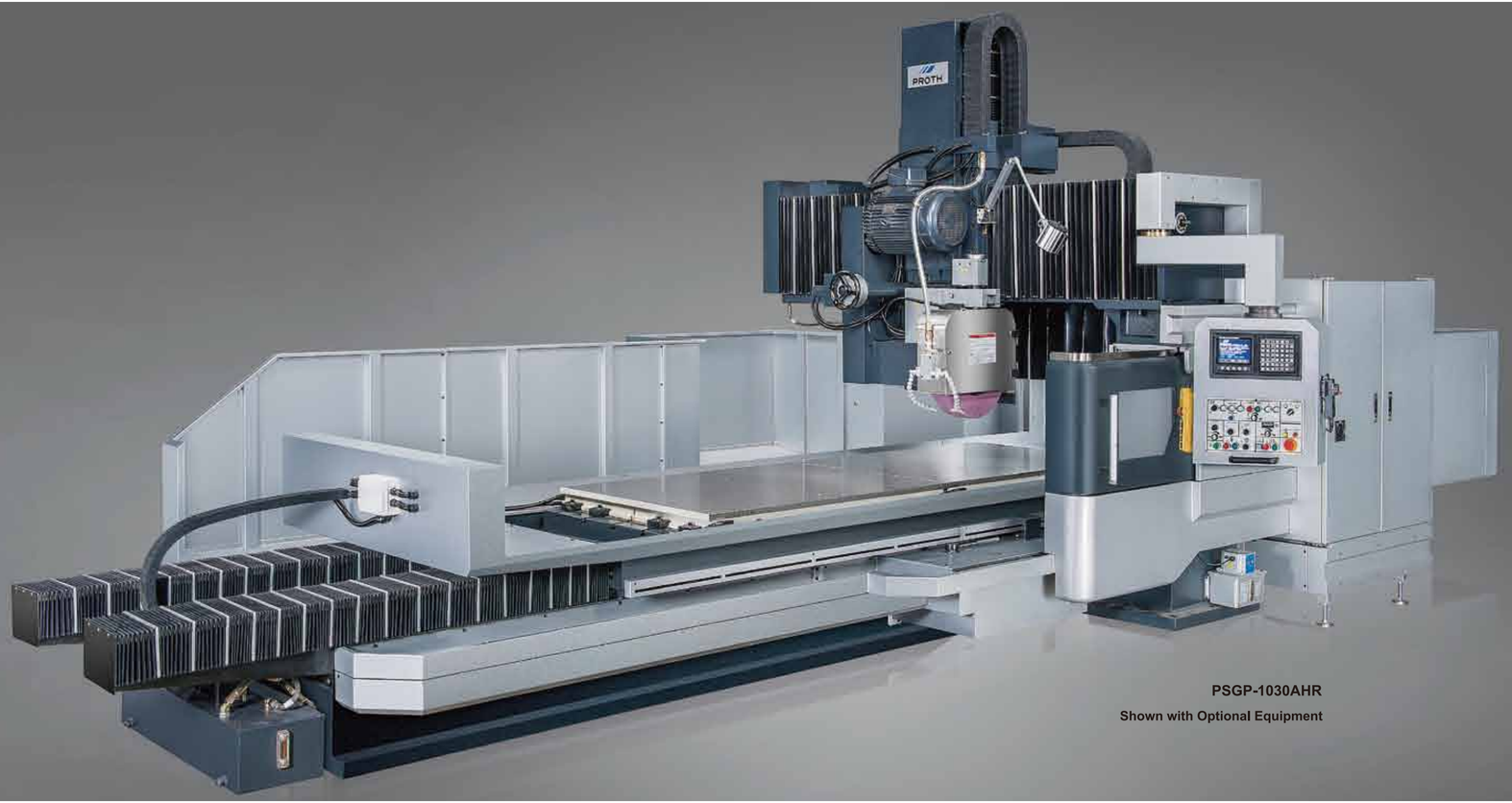
PROTH Surface Grinders

Leadership through Performance and Dependability

PROTH Industrial Co., Ltd. is a highly reputed manufacturer of precision surface grinders in Taiwan. Since being established in 1980, we have been dedicated to researching and developing the most comprehensive range of surface grinders, from conventional types to CNC types.

At **PROTH** we have an outstanding R&D team who constantly develop new models to meet customers' requirements and help customers to stay competitive. All surface grinders are developed and manufactured in-house. **PROTH** surface grinders have been sold around the world, and meet the rigorous quality requirements of such markets as Germany, Japan, and USA.

"Simple is the best". The simplest design contributes to maximizing excellent grinding performance.



PSGP-1030AHR

Shown with Optional Equipment

R&D Capabilities

Technical upgrade has been a tradition since **PROTH** was first established. Our R&D team consists of machinery, control system and hydraulic system engineers, who are always dedicated to more advanced surface grinding technology. With their combined experience and expertise, they not only develop new models to meet customers' requirements but also improve on existing models to achieve higher levels of performance. With unceasing enthusiasm towards R&D, **PROTH** offers supreme surface grinders with competitive edge.

Guaranteed Stability

Coins remain standing upright while the machine is in operation. The hydraulic system is specially designed to assure extremely smooth motion, quiet running and shock-free performance.

Excellent Features for Absolute Precision Grinding

The surface of longitudinal table ways and saddle ways are all hand scraped by experts to get perfect contact patterns between the matching surfaces and to insure high accuracy. High rigidity, heavy loading capability and lowest twist deformation, all yield maximum productivity with the highest surface finished and accuracy maintained.

Minimum Vibration and Deformation

Series models PSGC, PSGO, PSGP, are all first precision ground before final hand finish scraping. Integrated One (1) Piece casting design.

The slideway lengths are equal to table lengths, insuring freedom from table torsion and floatation.

Quality Assurance

Laser Scan Micrometer

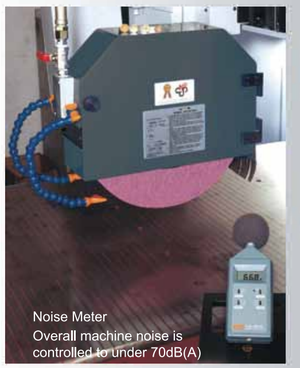
Surface Meter

Over the years, **PROTH** surface grinders have provided full satisfaction to each customer in both machine quality and performance. This reputation has resulted from our efforts of insisting on quality. At **PROTH** , we have a strong commitment to offering our customers the best machines.

In order to meet this commitment, rigorous quality control is conducted throughout the entire manufacturing process. Our quality control department is fully equipped with a comprehensive range of inspection instruments for rigorously inspecting parts and machines. All these guarantee the maximum dependability of each surface grinder from **PROTH** .

Programmable Measuring Station

Granite Tri-square Master



Noise Meter
Overall machine noise is controlled to under 70dB(A)

Vibration Meter

Better Finish, Greater Efficiency.

Double Column PSGP-AHR Type(Auto-cross, Hydraulic longitudinal, Rapid up/down)

- Cross Slideways: Flat-Dovetail Type Gibbed Ways.
- Longitudinal Slideways: Double V Ways.
- Longitudinal: Hydraulic.
- Cross: Automatic.
- Vertical: Rapid Up / Down.
- Auto Down Feed: AD1 standard.
- Straightness of table movement in longitudinal direction 0.02 mm/m.
- Straightness of table movement in transverse direction 0.02 mm/m.

Typical Grinding Examples

Shown with Optional Equipment

PSGP-1215AHR
Horizontal Head

Shown with optional equipment

PSGP-1040AHR
Horizontal Head and Optional Horizontal Head

Delivering Quality Grinding Results.

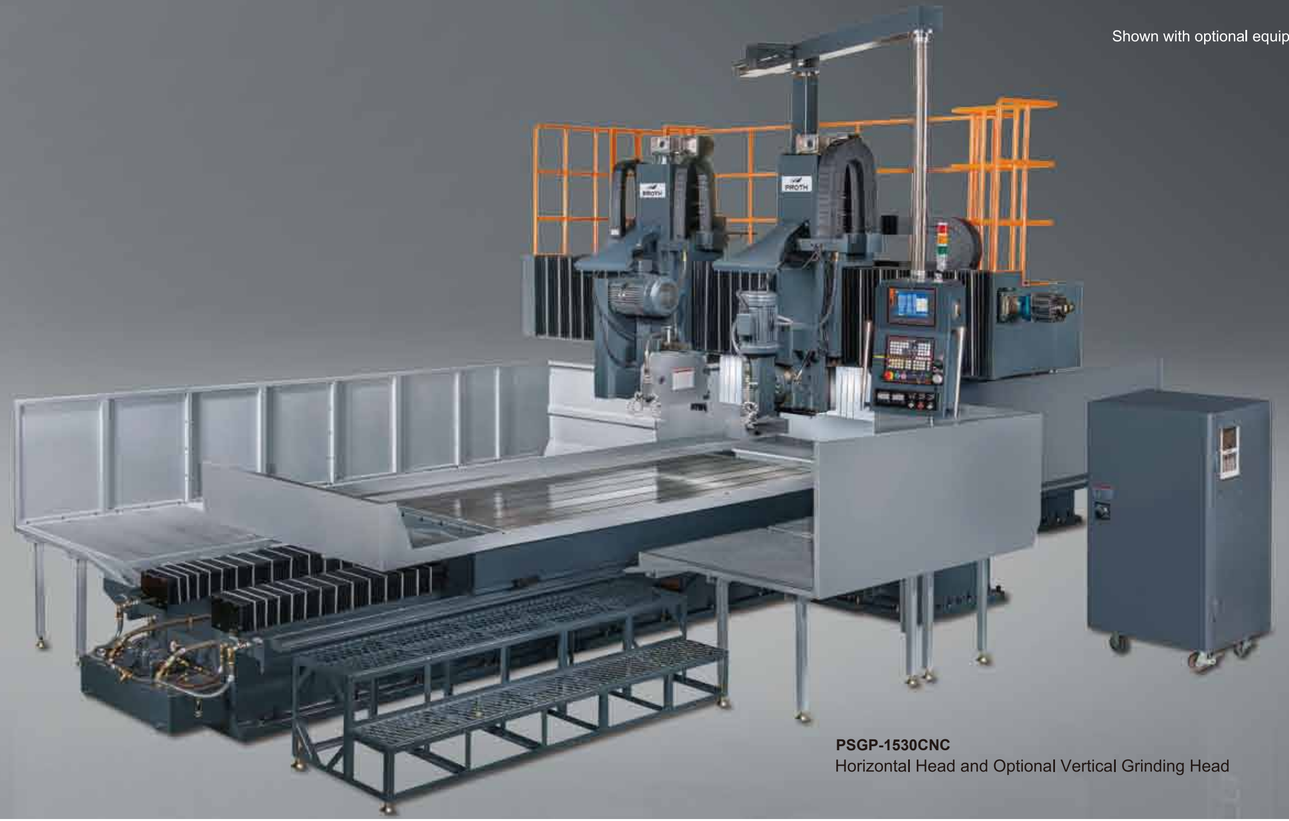
Double Column PSGP - CNC Type

- Cross Slideways: Flat-Dovetail Type Gibbed Ways
- Longitudinal Slideways: Double V Ways
- Longitudinal: Hydraulic
- Cross: CNC Controlled System
- Vertical: CNC Controlled System
- Controller: FANUC

PSGP-1020CNC
CNC Horizontal Head

Shown with Optional Equipment

Shown with optional equipment



PSGP-1530CNC
Horizontal Head and Optional Vertical Grinding Head

Performance

Hydraulic System: Extra Low Noise

- Two (2) single-acting hydraulic cylinders are used with their piston rods anchored at very specific positions. This enhances rigidity and creates a very stable table motion; table float is eliminated.
- A specially designed hydraulic system results in extra table movement, preventing excessive heating of hydraulic oil, and reducing table reversal shock.
- The hydraulic tank and pumping unit are isolated from the main machine body, which provides the following advantages:
  - Prevents heat from warm hydraulic oil from entering the machine body and causing expansion and distortion, which can impact finish workpiece accuracy.
  - Prevents any vibration generated by the hydraulic pumping system from being transferred to the base machine which can cause flutter marks on workpiece.
- Hydraulic type drive system for table left/right motion provides the smoothest, shock-free stepless feeds for superior workpiece finishes.
- Oil filtration is provided, which keeps the hydraulic oil supply free of dirt and grit enhancing the life of pistons, pumps, cylinders, O-rings and seals.

Stress Relieved Main Castings

- All the main machine casting components, such as base, table, saddle, column, etc., are all annealed TWICE with particular attention to removing all metallurgical stress.

Grinding Spindle

- The precision high rigidity spindle is of a cartridge type design.
- This provides for easier accessibility and service when maintenance is needed.
- Multiple Hi-Precision Anti-Friction axial and radial bearings are utilized specifically designed for absolute minimal play and run-out.
- A special type of grease-for-life bearing lubricant is accurately applied at the factory and sealed for long production hours of trouble free grinding.
- Spindle run-out is tested at better than 0.0025mm (0.0001") T.I.R.
- Spindles are quiet and vibration free.

Lubrication

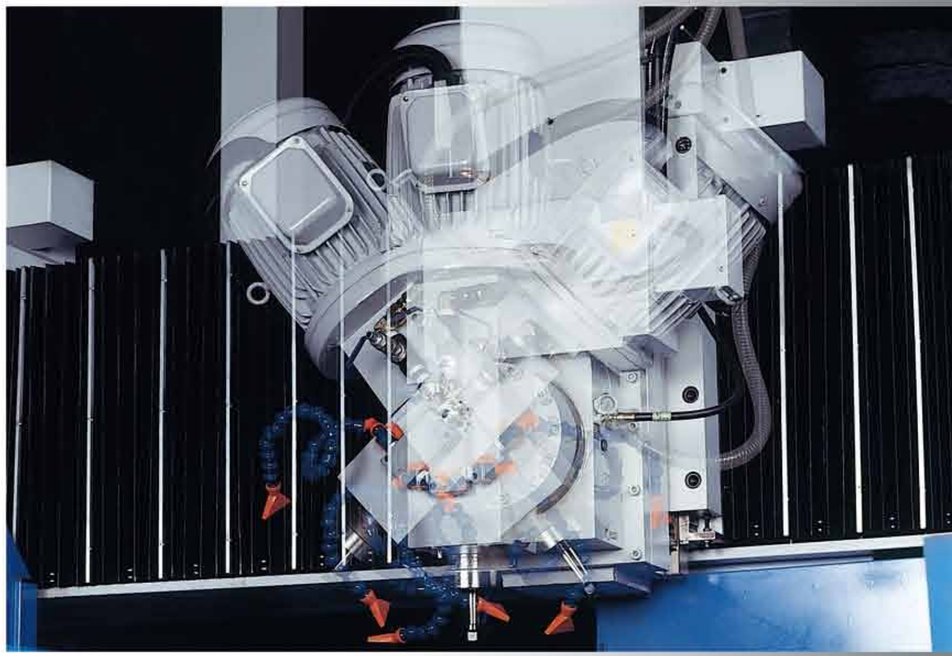
- Spindles:
  Ultra Hi Grade Sealed Bearings with specially formulated grease lubrication are partnered to provide long service life and lowest maintenance.
- Table Longitudinal Ways:
  - The table longitudinal ways are automatically lubricated with oil supplied from the hydraulic unit via a cartridge type oil filter.
  - It filters contaminate particles larger than 10 microns and prevents premature deterioration of the oil.
  - The filter keeps the oil in a clean condition, thus automatically keeping the exact oil film thickness as soon as the hydraulic system is activated so no lubrication shortage is encountered.

Low-Friction Coated Surfaces

- Most of the slideways consist of one cast iron precision scraped surface in contact with a specially designed anti-friction coated surface to provide smooth fluid motion.

CNC Universal Grinding Head (Optional)

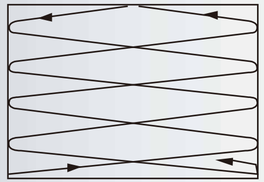
- Least command increment 0.001°.
- Swiveling range ±90°.
- The angle tiling is driven by servo motor with CNC processing.
- 2 selectable modes: Auto mode and MPG mode.
- Surface, side, vertical, angle and chamfer micro feed grinding are provided.
- The spindle motor inverter is fitted for maintaining the peripheral speed of wheel.



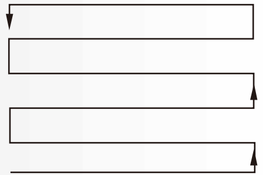
Optional Features and Attachment

Criss Cross Grinding (Standard)

1. The advantage of the criss-cross grinding option is that the cross feed speed is infinitely variable, yielding a very wide range of cross feed choices.
2. In criss-cross grinding, the table longitudinal movement and wheel head cross feed movement are synchronized and engaged simultaneously.
3. This grinding method is invaluable for grinding very thin workpieces efficiently.



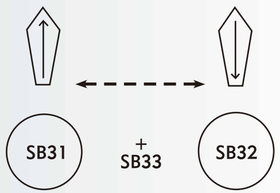
Criss-Cross Grinding



Incremental Grinding

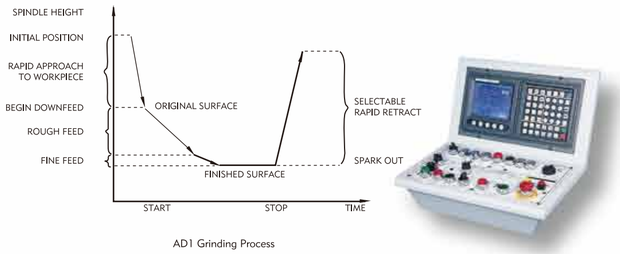
Electric Touch Cross Traverse Setting System (Standard)

1. The advantage of the electronic ' one-touch' system is to quickly electronically pre-set the beginning and end surface width of cross grinding to be accomplished. This can significantly improve production time.
2. Setting the system is simple:
   - Hold power rapid cross feed push-button down until the grinding wheel reaches the desired start position.
   - Press the start SB33 push-button, which will cause the indicator lamp on the command panel to flash.
   - Hold the power rapid opposite crossfeed push-button down until the desired finish location of the grinding wheel is achieved.
   - Push the SB33 push-button again, which will cause the lamp to flash again.
   - This is the desired end of cross feed grinding position and the settings are completed.
3. Positioning accuracy is 10mm(0.2")for PSGP series grinders.



Computerized Auto Down Feed AD1 (Standard)

1. Automatically rapidly approaches to the surface of workpiece for the proper position.
2. Minimum control increment is 0.001mm (0.0001").
3. Total stock removal resolution is up to 99999μm.
4. Total fine feed stock removal resolution is up to 99μm.
5. Setting of "Spark-out" grinding is up to 99 passes.
6. Selectable wheelhead retract clearance at job completion for convenient workpiece loading and unloading is up to 300mm (9.9inch).
7. Pause grinding function during grinding cycles via "HOLD" button.
8. Cycle and modes: a. Spindle motor off. b. Hydraulic motor off. c.Power off.
9. After the grinding processing is completed.
10. 2 selectable grinding modes:"SURFACE" and "PLUNGE".
11. Slow, fast and fixed speed are provided.



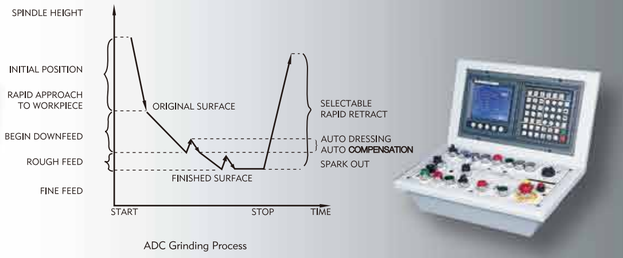
AD1 Grinding Process

Auto Down Feed ADC (Optional)

This attachment includes:
Computerized auto down feed AD 1
2 axes automatic dresser and auto compensation

Features:

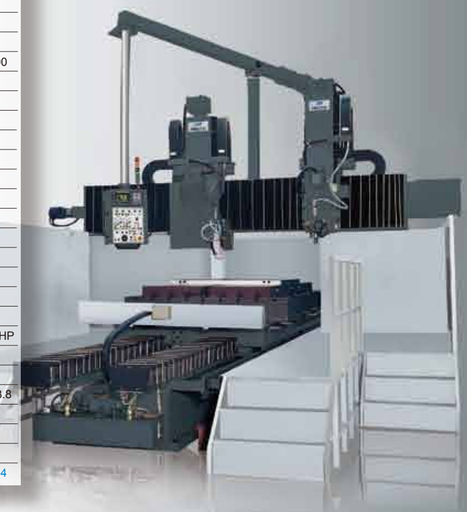
1. Automatically rapidly approaches to the surface of workpiece for the proper position.
2. Minimum control increment is 0.001mm (0.0001").
3. Total stock removal resolution is up to 99999μm.
4. Total fine feed stock removal resolution is up to 99μm.
5. Setting of "Spark-out" grinding is up to 99 passes.
6. Selectable wheelhead retract clearance at job completion for convenient workpiece loading and unloading is up to 300mm (9.9inch).
7. Pause grinding function during grinding cycles via "HOLD" button.
8. Cycle and modes: a.Spindle motor off. b.Hydraulic motor off. c.Power off.
9. After the grinding processing is completed.
10. 2 selectable grinding modes:"SURFACE" and "PLUNGE".
11. Slow, fast and fixed speed are provided.



ADC Grinding Process

Specification:

SPECIFICATION / MODELS			PSGP																	
			1015AHR	1020AHR	1025AHR	1030AHR	1040AHR	1050AHR	1060AHR	1215AHR	1220AHR	1225AHR	1230AHR	1240AHR	1250AHR	1260AHR	1522AHR	1530AHR	1540AHR	1550AHR	1560AHR
General Capacity	Max. travel (cross x longitudinal)	mm	1200x1650	1200x2150	1200x2650	1200x3150	1200x4150	1200x5150	1200x6150	1400x1650	1400x2150	1400x2650	1400x3150	1400x4150	1400x5150	1400x6150	1900x2350	1900x3150	1900x4150	1900x5150	1900x6150
	Wheel bottom to table (Vertical Head)	mm	0-750							0-750							100-800 (350-1000)				
	Spindle center height from table	mm	approx. 1100							approx. 1100							approx. 1100 (1350)				
	Max. height from table top to bottom of standard wheel	mm	845							845							850				
	Grinding surface of table	mm	1000x1500	1000x2000	1000x2500	1000x3000	1000x4000	1000x5000	1000x6000	1200x1500	1200x2000	1200x2500	1200x3000	1200x4000	1200x5000	1200x6000	1500x2200	1500x3000	1500x4000	1500x5000	1500x6000
Longitudinal Movement	Hydraulic table speed (60Hz)	m/min	2-25 (1-25)							2-25 (1-25)							2-25 (1-25)				
Cross Movement	Clearance between the columns	mm	1200							1400							2000				
	Intermittent cross feed-approx.(Electro-mechanical)	mm/feed	0.1-35							0.1-35							0.1-35				
	Continuous cross feed-approx.(Electro-mechanical)	mm/min	3000							3000							3000				
	Hand feed per revolution	mm	5				10			5		5		10			10				
	Hand feed per division	mm	0.02				0.05			0.02		0.02		0.05			0.05				
Vertical Downfeed	Rapid traverse approx. (option) (50Hz)	mm/min	220							220							220				
	MPG per revolution		0.1mmx1/x5/x10							0.1mmx1/x5/x10							0.1mmx1/x5/x10				
	MPG per division		0.001mmx1/x5/x10							0.001mmx1/x5/x10							0.001mmx1/x5/x10				
Grinding Wheel	Dimension (O.D x W x I.D)	mm	510x100x203							510x100x203							510x100x203				
	Spindle speed	r.p.m.	1150							1150							1150				
Motor	Horizontal head spindle motor		11(15,18.5)kW/15(20,25)HP							11(15,18.5)kW/15(20,25)HP							11(15,18.5)kW/15(20,25)HP				
	Vertical head spindle motor		7.5kW/10HP							7.5kW/10HP							7.5kW/10HP				
	Hydraulic motor		7.5kW/10HP				11kW/15HP	15kW/20HP	20.5kW/27.5HP	7.5kW/10HP		7.5kW/10HP		13kW/17.5HP	15kW/20HP	20.5kW/27.5HP	13kW/17.5HP	13kW/17.5HP	15kW/20HP	20.5kW/27.5HP	22.5kW/30HP
Weight	Net weight	kg	10000	13500	17500	22000	36500	40000	44500	14000	14500	18500	23000	37500	41000	45500	34000	39000	45000	50000	56000
	Gross weight	kg	13000	17000	21500	26500	41000	45000	49500	17000	18000	22500	27500	41000	46000	51500	37000	43000	49500	55000	62000
Machine Size	Dimension (L x W x H)	m	5.1x2.9x3.4	6.2x2.9x3.4	7.3x2.9x3.4	8.4x2.9x3.4	11.2x2.9x3.5	13.4x2.9x3.5	15.6x2.9x3.5	5.4x2.9x3.4	6.2x2.9x3.4	7.3x2.9x3.4	8.4x2.9x3.4	11.2x2.9x3.5	13.4x2.9x3.5	15.6x2.9x3.5	6.6x3.5x3.8	8.4x3.5x3.8	11.2x3.5x3.8	13.4x3.5x3.8	15.6x3.5x3.8
CNC Specification	Crossfeed rapid feedrate (approx.)	mm/min	2000							2000							2000				
	Cross/Vertical infeed least input increment	mm	0.001							0.001							0.001				
	Rapid vertical rate	mm/min	500							500							500				
	Machine Size Dimension (L x W x H)	m	5.1x4.6x3.9	6.2x4.6x3.9	7.3x4.6x3.9	8.4x4.6x3.9	11.2x4.6x4.3	13.4x4.6x4.3	15.6x4.6x4.3	5.1x4.6x3.9	6.2x4.6x3.9	7.3x4.6x3.9	8.4x4.6x3.9	11.2x4.6x4.3	13.4x4.6x4.3	15.6x4.6x4.3	6.6x5x4.4	8.4x5x4.4	11.2x5x4.4	13.4x5x4.4	15.6x5x4.4



PSGP-1540CNC
Shown with optional equipment

* Specifications in blue are for CNC models only, and vertical head is an optional equipment.
* Vertical head is an optional equipment.
* Since we subscribe to a process of continuous improvement for our products, specifications are subject to change without notice.
* Machine outward appearance will change depending upon different optional equipment selected.
* Equipment marked with () is available at additional extra charge. Other special applications may be provide upon specific requests from customers. Please contact us for more details.

Superior Precision, Multiple Functions

Rotary Double Column PSRP Type

- Cross: Criss Cross Grind
- Vertical: Auto Down Feed AD1

PSRP-1000S
Shown with optional equipment

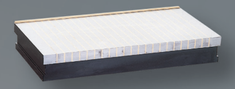
Specification:

SPECIFICATION / MODELS			PSRP		
			1000S	1200S	1500S
General Capacity	Max. grinding radius	mm	600	700	800
	Vertical grinding diameter	mm	Ø200-Ø1000	Ø200-Ø1200	Ø200-Ø1500
	Spindle center height from table	mm	900(1100)		
	Max. height from table top to bottom of standard wheel	mm	645		
	Table diameter	mm	1100	1300	1500
Rotary Table	Max. speed	r.p.m.	10-60		
	Table motor		3.75kW/5HP		
Cross Movement	Continuous cross feed	mm/min	3000		
	Hand feed per revolution	mm	10		
	Hand feed per division	mm	0.05		
Vertical Downfeed	Rapid traverse approx. (option) (50Hz)	mm/min	220		
	MPG per revolution		0.1mmx1/x5/x10		
	MPG per division		0.001mmx1/x5/x10		
Grinding Wheel	Dimension (O.DxWxI.D)	mm	510x100x208		
	Spindle speed	r.p.m.	1150		
Motor	Spindle motor		11(15)kW/15(20)HP		
	Vertical head spindle motor		7.5kW/10HP		
Weight	Net weight	kg	15000	16000	18000
	Gross weight	kg	16500	18000	21000
Machine Size	Dimension (LxWxH)	m	3x4.2x3.8		

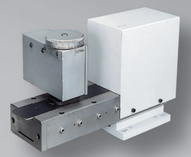
Optional Accessories

Automatic Paper Strip Filter
with/ without Magnetic Separator

Dynamic Balancers System



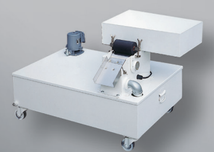
Electro Magnetic Chuck



Auto-Parallel Dressing
Attachment 2 Axes Full Auto
(Electrical Cross + Step Control Down)

Level Type Wheel Balancer

Inclinable Electro Magnetic Chuck



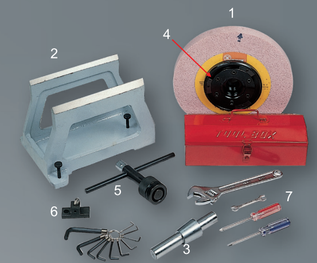
Cooling System with Magnetic Separator

Cooling System

Wheel Flange

Standard Accessories

Oil Temperature Control System
(except PSRP series)



20"WHEEL

1. Wheel
2. Wheel balancer
3. Wheel balancer arbor
4. Wheel flange
5. Extractor
6. Table mounted diamond dresser
7. Tools & tool box