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PALMARY PRODUCTS

- Centerless Grinder
- Cylindrical Grinder
- Internal Grinder
- Vertical Grinder
- Surface Grinder
- Special Purpose Grinder

PALMARY

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PALMARY

A Total Dedication to New Technological Level

HIGH PRECISION
CENTERLESS GRINDER SERIES

PALMARY

PALMARY MACHINERY CO., LTD. Precision, Perfection and Excellence

PALMARY Centerless Grinders

Set New Standards...

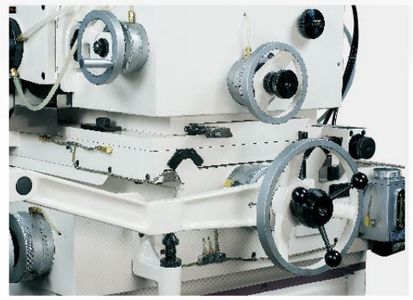
"The concept behind PALMARY is to design and manufacture the centerless grinder that provides the best possible quality. No matter whether for machine rigidity, stability, heavy machining capability, accuracy or humanified operations, every machine fully reflects PALMARY's tradition of "Care of Every Detail"."

Rigid Machine Structure

- The machine structure is manufactured from high quality Meehanite cast iron, heat treated and stress relieved before machining.
- Slideways are high frequency hardened and precision ground. Maximum material stability for deformation-free and outstanding wear resistance.

Precision Spindles

- The grinding wheel spindle and the regulating wheel spindle are precision machined and made from Nickel Chromolybedenum alloy steel (SNCM-439), processed with normalization, aging, and high frequency induction heat treatment, then the spindle proceed to sub zero treatment at minus 180。C for 24 hours, and finally finished after precision machining and grinding.
- The inside of spindle is tempered to hardness HRC 25。~30。, while surface hardness reaches over HRC 62. The precision ground spindle is excellent for heavy-duty machining and features powerful torque, long service life, deformation-free and maximum wear resistance.



Slide Table

- Upper slide swiveling is easy and accurate to adjust for making the machine suitable for infeeding grinding. Also, it allows grinding for a varied diameter of workpieces. The Upper slide with +5。~ -5。swiveling allows taper grinding by using infeed grinding mode.
- With thrufeed grinding, the Upper slide provides a surface contact adjustment between the workpiece and grinding wheel. Swiveling adjustment range is +5。~ -3。.
- Dovetailed slideway on the upper slide features smooth and accurate feeding and is lubricated by a centralized lubricator.
- The bottom slide moves on "∧" shaped and double-wedged ways. The slideways are hardened and precision ground. They feature smooth movement and properly protected to prevent dust from entering. Micrometric feed adjustment unit is 0.001 mm to meet high accuracy requirements for all workpieces.

PALMARY
Committed to Excellence

"Stable, Precise, Internationally Recognized Quality

The structure of the PALMARY centerless grinder is thoroughly analyzed and designed by our R&D engineers. They conduct a deep structure analysis of the stress/strain relationship, assuring lifetime deformation-free performance. Each machine from PALMARY presents the outstanding accuracy as you have come to expect. That is why PALMARY's centerless grinders are fully recognized by worldwide customers."

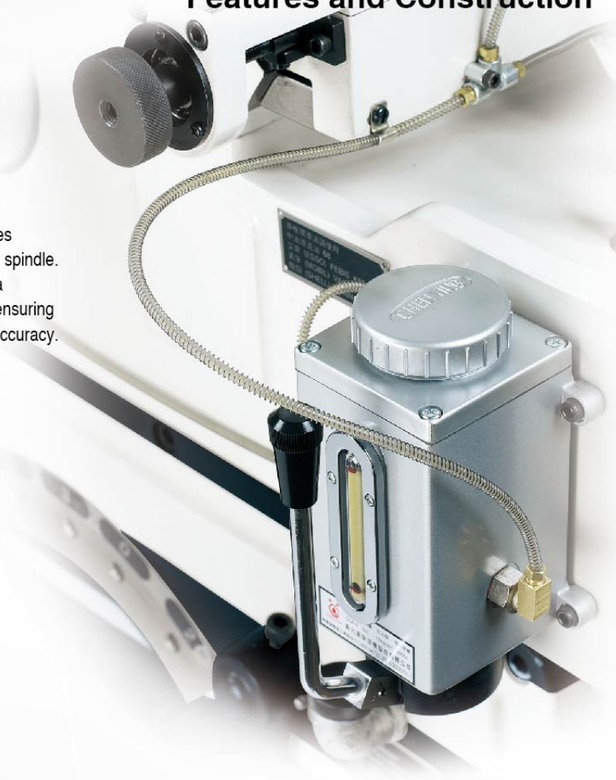
Example of Grinding Workpieces

Feed Screw

- The feed screw is manufactured from Nickel Chromolybedenum alloy steel (SNCM-4). It is also normalized, high frequency hardened treated and precision ground.
- Specially-designed adjustable nut features easy adjustment, high feeding accuracy, smooth motion and excellent wear resistance.

Lubrication System

- The automatic lubricator provides lubrication to the grinding wheel spindle.
- All slideways are lubricated by a centralized lubrication system, ensuring proper lubrication and feeding accuracy.



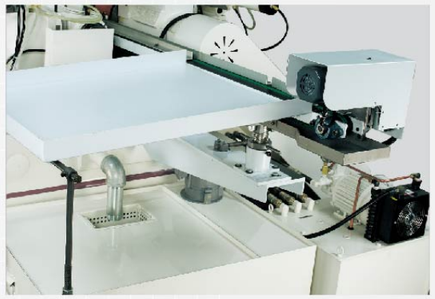
PALMARY Centerless Grinders Performance-

Exceeding Your Expectations!

"If you are serious about grinding accuracy and efficiency, the centerless grinders from PALMARY will meet your stringent challenges. No matter if you choose an economic model, a servo-controlled model, or NC-controlled model, each one is quality constructed throughout for delivering the operational performance that you expect. Also, you will agree with that: "This is a True Grinding Performer". "

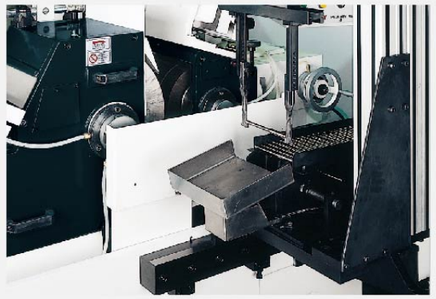
Automatic Loading Equipment for Thrufeed Grinding (Optional)

- Suitable for automatic loading operation for round tube and bar stock.
- Equipped with a storage tray for automatic workpiece infeed.
- It eliminates manual workpiece infeed while enormously increasing total efficiency.



Automatic Unloading Equipment for Thrufeed Grinding (Optional)

- Designed for automatic unloading for round tube and bar stock, this equipment can avoid workpiece surface scratching. It is also suitable for online operation while performing two to three grinding processes. The conveyor is easy to adjust. Equipped with a parts tray for convenient parts collection after grinding.



Loading and Unloading Equipment for Infeed Grinding (Optional)

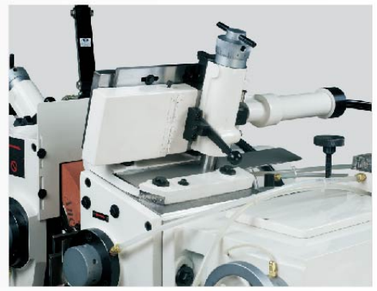
- It employs a robot arm to pick workpieces from the tray and place them into the machine for grinding. The other robot arm picks the finished workpieces and places them on the collection tray. This equipment provides a fully automatic grinding operation that saves labor while enormously upgrading production efficiency.

Pressure Switch

- When starting the grinding wheel and regulating wheel spindle, this pressure switch allows starting only when oil enters into bearings thereby providing safety protection for the spindle bearings.

Hydraulic Cooling Device

- The lubrication system for bearings on grinding wheel spindle, regulating wheel spindle and hydraulic system are driven by the same hydraulic pump. A cooling fan is equipped for effectively reducing oil temperature.



Dresser for Grinding Wheel and Regulating Wheel

- Dresser structure is manufactured from alloy cast iron and is heat treated for wear resistance.
- Hydraulically operated dressing motion.
- Variable dressing speed.
- Dresser stand for regulating wheel can be adjusted to suit workpiece requirements, assuring high cylindrical accuracy.

High Precision Centerless Grinder
Economic Servo Series

PC-12S / 18S / 1810S / 1812S / 20S

- Regulating wheel is driven by servomotor.
- Low speed; high torque output.
- Easy to operate and adjust.

SPECIFICATIONS	PC-12S	PC-18S	PC-1810S	PC-1812S	PC-20S
Grinding Wheel					
Standard grinding range (Dia.)	Ø1~Ø40 mm	Ø1~Ø80 mm	Ø1~Ø80 mm	Ø1~Ø80 mm	Ø1~Ø80 mm
Capacity increases with special arrangement	Ø30~Ø60 mm	Ø40~Ø150 mm	Ø40~Ø150 mm	Ø40~Ø150 mm	Ø40~Ø150 mm
Grinding wheel size (O.D. x width x I.D.)	Ø305 x 150 x Ø120	Ø455 x 205 x Ø228.6	Ø455 x 255 x Ø228.6	Ø455 x 305 x Ø228.6	Ø510 x 205 x Ø304.8
Linear velocity	33 m/s	33 m/s	33 m/s	33 m/s	33 m/s
Grinding wheel motor	7-1/2 HP x 4P	15 HP x 4P	15 HP x 4P	20 HP x 4P	20 HP x 4P
Regulating Wheel					
Regulating wheel size (O.D. x width x I.D.)	Ø205 x 150 x Ø90	Ø255 x 205 x Ø111.2	Ø255 x 255 x Ø111.2	Ø255 x 305 x Ø111.2	Ø305 x 205 x Ø127
Regulating wheel speed	10 ~ 300 R.P.M. (Variable)	10 ~ 300 R.P.M.(Variable)	10 ~ 300 R.P.M.(Variable)	10 ~ 300 R.P.M.(Variable)	10 ~ 300 R.P.M.(Variable)
Regulating wheel motor / S series	1.5 KW servo motor	2.0 KW servo motor	2.0 KW servo motor	3.5 KW servo motor	5 KW servo motor
Regulating wheel tilt angle	+5° ~ -3°	+5° ~ -3°	+5° ~ -3°	+5° ~ -3°	+5° ~ -3°
Regulating wheel swivel angle	±5°	±5°	±5°	±5°	±5°
Handwheel Graduation					
Upper slide feed graduation	4 mm/rev. 0.025 mm/graduation	3.5 mm/rev. 0.05 mm/graduation	3.5 mm/rev. 0.05 mm/graduation	3.5 mm/rev. 0.05 mm/graduation	3.5 mm/rev. 0.05 mm/graduation
Upper slide micro-feed graduation	0.1 mm/rev. 0.001 mm/graduation	0.1 mm/rev. 0.001 mm/graduation	0.1 mm/rev. 0.001 mm/graduation	0.1 mm/rev. 0.001 mm/graduation	0.1 mm/rev. 0.001 mm/graduation
Lower slide feed graduation	7 mm/rev. 0.05 mm/graduation	9 mm/rev. 0.05 mm/graduation	9 mm/rev. 0.05 mm/graduation	9 mm/rev. 0.05 mm/graduation	9 mm/rev. 0.05 mm/graduation
Lower slide micro-feed graduation	0.2 mm/rev. 0.001 mm/graduation	0.2 mm/rev. 0.001 mm/graduation	0.2 mm/rev. 0.001 mm/graduation	0.2 mm/rev. 0.001 mm/graduation	0.2 mm/rev. 0.001 mm/graduation
Trimming device graduation	1.25 mm/rev. 0.01 mm/graduation	2 mm/rev. 0.01 mm/graduation	2 mm/rev. 0.01 mm/graduation	2 mm/rev. 0.01 mm/graduation	2 mm/rev. 0.01 mm/graduation
Drive Motors					
Hydraulic pump motor	1 HP x 4P	1 HP x 4P	1 HP x 4P	1 HP x 4P	1 HP x 4P
Coolant pump motor	1/8 HP x 2P	1/4 HP x 2P	1/4 HP x 2P	1/4 HP x 2P	1/4 HP x 2P
Machine Dimensions	1750 x 1050 x 1400 mm	2200 x 1840 x 1530 mm	2200 x 1840 x 1530 mm	2350 x 1950 x 1530 mm	2200 x 1900 x 1530 mm
Net weight	1650 kgs	2900 kgs	3000 kgs	3400 kgs	3700 kgs

• The mentioned specifications & dimensions are subject to change without notice.

PALMARY Committed to Excellence

High Precision Centerless Grinder
NC Servo Series

PC-12S-NC / 18S-NC / 1810S-NC / 1812S-NC / 20S-NC

- Equipped with a touch-sensing screen with teach-in operational control.
- Easy to adjust sizes. Easy to learn and understand without need of program editing.
- PLC controls oil temperature to reduce errors to minimum.
- Servo control for feeding mechanism with accurate micrometric feed adjustment.
- Variable speed for regulating wheel spindle.
- Available to equip with automatic dressing and compensation function. (optional accessory)

NC Control Panel

SPECIFICATIONS	PC-12S-NC	PC-18S-NC	PC-1810S-NC	PC-1812S-NC	PC-20S-NC
Grinding Wheel					
Standard grinding range (Dia.)	Ø1~Ø40 mm	Ø1~Ø80 mm	Ø1~Ø80 mm	Ø1~Ø80 mm	Ø1~Ø80 mm
Capacity increases with special arrangement	Ø30~Ø60 mm	Ø40~Ø150 mm	Ø40~Ø150 mm	Ø40~Ø150 mm	Ø40~Ø150 mm
Grinding wheel size (O.D. x width x I.D.)	Ø305 x 150 x Ø120	Ø455 x 205 x Ø228.6	Ø455 x 255 x Ø228.6	Ø455 x 305 x Ø228.6	Ø510 x 205 x Ø304.8
Linear velocity	33 m/s	33 m/s	33 m/s	33 m/s	33 m/s
Grinding wheel motor	7-1/2 HP x 4P	15 HP x 4P	15 HP x 4P	20 HP x 4P	20 HP x 4P
Regulating Wheel					
Regulating wheel size (O.D. x width x I.D.)	Ø205 x 150 x Ø90	Ø255 x 205 x Ø111.2	Ø255 x 255 x Ø111.2	Ø255 x 305 x Ø111.2	Ø305 x 205 x Ø127
Regulating wheel speed	10 ~ 300 R.P.M. (variable)	10 ~ 300 R.P.M. (Variable)	10 ~ 300 R.P.M. (Variable)	10 ~ 300 R.P.M. (Variable)	10 ~ 300 R.P.M. (Variable)
Regulating wheel motor / S series	1.5 KW servomotor	3.0 KW servo motor	3.0 KW servo motor	3.5 KW servo motor	5 KW servo motor
Regulating wheel tilt angle	+5° ~ -3°	+5° ~ -3°	+5° ~ -3°	+5° ~ -3°	+5° ~ -3°
Regulating wheel swivel angle	±5°	±5°	±5°	±5°	±5°
Handwheel Graduation					
Upper slide feed graduation	4 mm/rev. 0.025 mm/graduation	3.5 mm/rev. 0.05 mm/graduation	3.5 mm/rev. 0.05 mm/graduation	3.5 mm/rev. 0.05 mm/graduation	3.5 mm/rev. 0.05 mm/graduation
Upper slide micro-feed graduation	0.1 mm/rev. 0.001 mm/graduation	0.1 mm/rev. 0.001 mm/graduation	0.1 mm/rev. 0.001 mm/graduation	0.1 mm/rev. 0.001 mm/graduation	0.1 mm/rev. 0.001 mm/graduation
Lower slide feed graduation	7 mm/rev. 0.05 mm/graduation	9 mm/rev. 0.05 mm/graduation	9 mm/rev. 0.05 mm/graduation	9 mm/rev. 0.05 mm/graduation	9 mm/rev. 0.05 mm/graduation
Trimming device graduation	1.25 mm/rev. 0.01mm/graduation	2 mm/rev. 0.01 mm/graduation	2 mm/rev. 0.01 mm/graduation	2 mm/rev. 0.01 mm/graduation	2 mm/rev. 0.01 mm/graduation
Drive Motors					
Hydraulic pump motor	1 HP x 4P	1 HP x 4P	1 HP x 4P	1 HP x 4P	1 HP x 4P
Coolant pump motor	1/8 HP x 2P	1/4 HP x 2P	1/4 HP x 2P	1/4 HP x 2P	1/4 HP x 2P
Machine Dimensions	1750 x 1050 x 1400 mm	2200 x 1840 x 1530 mm	2200 x 1840 x 1530 mm	2350 x 1950 x 1530 mm	2350 x 1900 x 1530 mm
Net weight	1700 kgs	3000 kgs	3000 kgs	3600 kgs	3600 kgs

• The mentioned specifications & dimensions are subject to change without notice.

PALMARY Committed to Excellence

High Precision Centerless Grinder
High Speed Series

PC-24S / 2410S / 2412S

- High peripheral speed of grinding wheel up to 3,000 M/min provides increased efficiency and for good parts surface finish.
- Hydraulically operated dressing for grinding wheel and regulating wheel.
- Regulating wheel speeds are variable, ranging from 15 ~ 300 rpm.
- Dresser stand is manufactured from special alloy for excellent wear resistance.
- Regulating wheel head and work rest swivel simultaneously providing added convenience for cylindricity accuracy adjustment.

SPECIFICATIONS	PC-24S	PC-2410S	PC-2412S
Grinding Wheel			
Standard grinding range (dia.)	Ø1~Ø100 mm	Ø1~Ø100 mm	Ø1~Ø100 mm
Grinding wheel size (O.D. x Width x I.D.)	Ø610 x 205 x Ø304.8 mm	Ø610 x 255 x Ø304.8 mm	Ø610 x 305 x Ø355.6 mm
Grinding wheel motor	30 HP x 4 P	30 HP x 4 P	30 HP x 4 P
Linear velocity	45 m/s	45 m/s	45 m/s
Regulating Wheel			
Regulating wheel speed (Infinitely variable)	15 ~ 300 R.P.M.	15 ~ 300 R.P.M.	15 ~ 300 R.P.M.
Regulating wheel size (O.D. x Width x I.D.)	Ø305 x 205 x Ø127 mm	Ø305 x 255 x Ø127 mm	Ø330 x 305 x Ø127 mm
Regulating wheel motor	5 KW servo motor	5 KW servo motor	5 KW servo motor
Regulating wheel tilt angle	-2° +5°	-2° +5°	-2° +5°
Regulating wheel swivel angle	±3°	±3°	±3°
Drive Motors			
Hydraulic pump motor	0.75 kw	0.75 kw	0.75 kw
Coolant pump motor	1/2 HP	1/2 HP	1 HP
Machine Dimensions	2610 x 1900 x 1650 mm	2610 x 1900 x 1650 mm	2810 x 2100 x 1650 mm
Net weight	4500 kgs	4800 kgs	6000 kgs

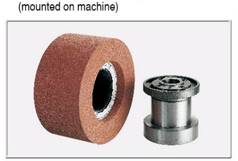
• The mentioned specifications & dimensions are subject to change without notice.

Thrufeed Carbide Blade & Infeed Carbide Blade Reference List

Workpiece	Carbide Blade Thickness 12 / 18	Workpiece	Carbide Blade Thickness 12	Carbide Blade Thickness 18
Ø1.5 - 2.5m/m	t=1 m/m	Ø8.1 - 10 m/m	t=6 m/m for Ø10	t=6 m/m for Ø10
Ø2.6 - 4.0m/m	t=2 m/m	Ø10.1 - 16 m/m	t=8 m/m for Ø16	t=8 m/m for Ø16
Ø4.1 - 5.0m/m	t=3 m/m	Ø12 - 20 m/m	t=8 m/m for Ø20	t=10 m/m for Ø20
Ø5.1 - 7m/m	t=4 m/m	Ø15 - 30 m/m	t=13 m/m for Ø30	t=13 m/m for Ø30
Ø7.1 - 8m/m	t=5 m/m	Ø25 - 50 m/m	t=20 m/m for Ø40	t=20 m/m for Ø50

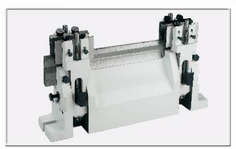
Standard Accessories

1. Regulating wheel and flange x 1 set (mounted on machine)



2. Grinding wheel and flange x 1 set (mounted on machine)

3. Infeed work rest and carbide blade x 1 set



4. Thrufeed work rest and carbide blade x 1 set

5. Standard electric equipment x 1 set (mounted on machine)

6. Oil tank x 1 set (incl. oil cooling fan)

7. Standard coolant system x 1 set

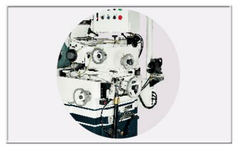
8. Diamond tools x 2 pcs (mounted on machine)

9. Work lamp x 1 set (mounted on machine)

10. Tool box and kits x 1 set

Optional Accessories

1. Wheel balancing stand and arbor



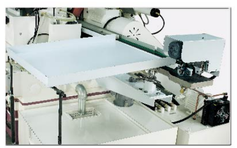
2. Automatic infeed attachment

3. Manual feeder for infeed grinding (up and down)

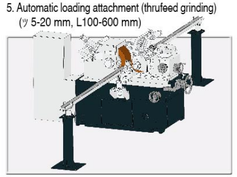
4. Hydraulic work ejector (infeed grinding)

5. Automatic loading attachment (thrufeed grinding) (ϕ 5-20 mm, L100-600 mm)

6. Automatic feeder for thrufeed grinding (hopper type) (ϕ 2-8 mm, L50-180 mm)



7. Automatic unloading attachment (thrufeed grinding)



8. V Type Supporter for long bar grinding (ϕ2-14 mm)

9. Profile grinding attachment

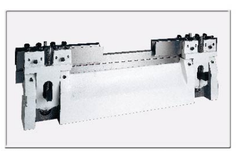
8. Magnetic coolant separator

11. Magnetic with paper filter

12. Hydrocyclone coolant separator

13. Auto. loading and unloading attachment (infeed grinding)

14. Vibratory feeder (thrufeed grinding)



15. Long work rest (thrufeed grinding) L: 250 - 500mm

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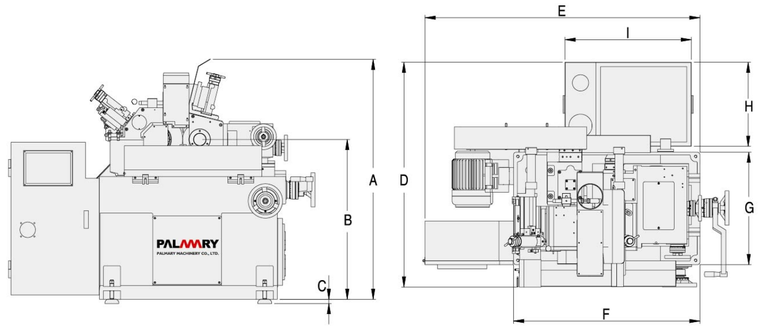
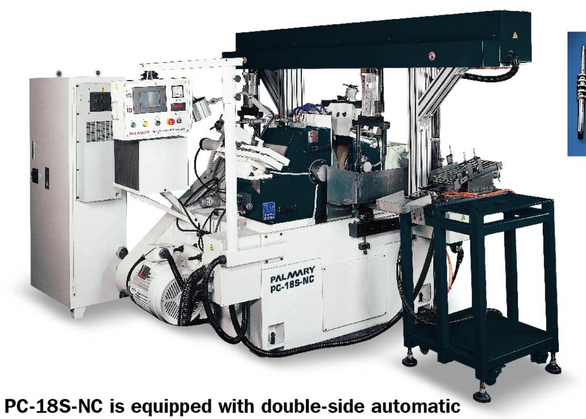
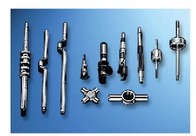
Dimensions and Floor Occupation



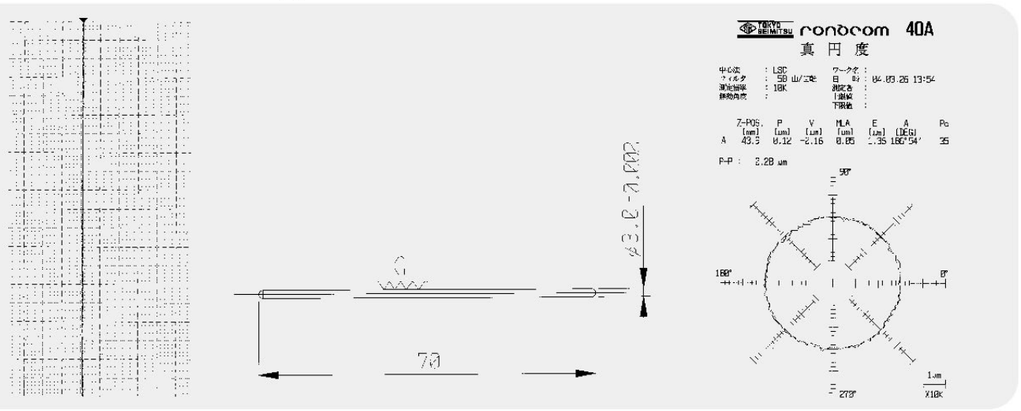
Model	A	B	C	D	E	F	G	H	I
12	1400	934	25	1400	1785	1085	660	490	735
18/1810	1600	988	25	2000	2300	1450	925	700	1000
1812/20	1635	988	25	2200	2355	1555	1066	700	1000
24/2410	1655	990	25	2205	2730	1930	1040	700	1000
2412	1700	1025	25	2450	2935	2260	1110	700	1000





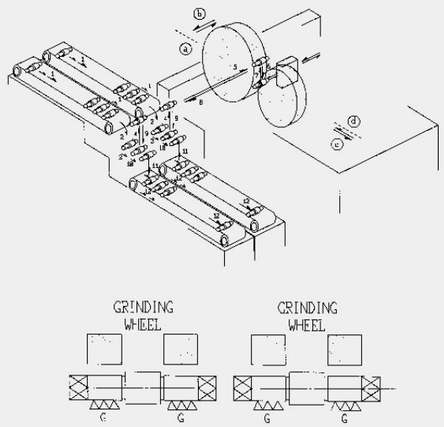
PC-18S-NC is equipped with double-side automatic loading and unloading equipment for infeed grinding.

Automation Process (I)



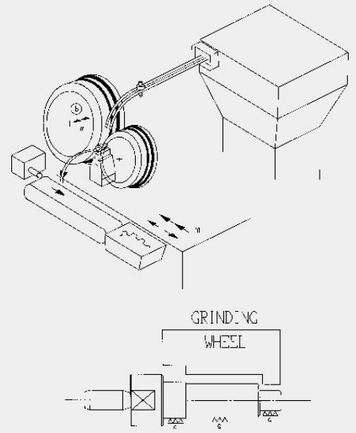
- Work sample: Motor shaft
- Grinding wheel: GC100KV
- Peripheral speed: 2,000 M/min
- Workpiece material: SUS430
- Roundness: 0.2 μm (stock removal 0.15)
- Cylindricity: 0.3 μm
- Stock Removal
  - ▲ 1st rough: 0.15
  - ▲ 2nd fine: 0.025
  - ▲ 3rd finish: 0.02
- Feed Speed: 2.6 M/min
- Surface Finish: Ra = 0.029 μm; Rz = 0.220 μm; Rmax = 0.300 μm

Automation Process (II)



- Work sample: gear shaft
- Material: SCM415
- Grinding wheel: 38A60L
- Peripheral speed: 2,000 M/min
- Regulating wheel: A120R
- Regulating wheel speed: 21 rpm
- Cycle time: 15 sec. (including loading time of 2.5 sec.)
- Stock removal: 0.09 mm/dia.
- Roundness: 0.6 μ
- Cylindricity: 1.0 μ
- Surface finish: 0.15 Ra

Automation Process (III)



- Work sample: shaft
- Material: S45C
- Grinding wheel: WA60L
- Peripheral speed: 2,000 M/min
- Regulating wheel: A120R
- Regulating wheel speed: 30 rpm
- Cycle time: 18 sec. (including loading time of 2.5 sec.)
- Stock removal: 0.25 mm/dia.
- Roundness: 1.0 μ
- Cylindricity: 1.3 μ
- Surface finish: 0.20 Ra

Rigorous Quality Inspection

- PALMARY's Q.C. department is fully equipped with comprehensive high precision inspection instruments, providing in-process and final product inspection. These precision instruments enable us to achieve the highest quality level. PALMARY centerless grinders are fully satisfied to each customer around the world. This achievement results from our tradition of "Insisting on Quality".