PARAGON MACHINERY CO., LTD.
Company Profile

Oct. 2008
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1968 The founder, Mr. C.T. Cheng, by utilizing the facility of Ho Kuang plant, designed the first centerless grinder RC-10 and started to manufacture and sell.

1972 Paragon Machinery Ltd. was established by Mr. C.T. Cheng and Mr. J.W. Liu, the chairman of Ho Kuang plant.

1972 Moved to a new plant with 1800 square meters at Sinping Rd., Taiping City.

1972 Announced RC-12 and RC-18 centerless grinder and GU-20 universal cylindrical grinder.


1977 Increased capital and changed name as Paragon Machinery Co., Ltd.

1982 Announced RC-14, RC-16 and RC-20 centerless grinder.

1983 Announced RHC-500, 620, 630 high speed centerless grinder (heavy-duty).

1984 Announced hydrostatic bearings of grinding spindle and applied on universal cylindrical grinder and centerless grinder.

1986 Announced RIG-150 serial internal grinder.

1987 Announced GU-32 serial and CNC cylindrical grinder.

1989 Expand the second factory with 6000 square meters at Dongping Rd., Taiping City, Taichung.
History

- 1990  Announced CNC centerless grinder.
- 1991  Announced CNC internal grinder.
- 1994  Announced CNC cylindrical grinder.
- 1995  Progressed technique cooperation with Sun Yat-sen Research Institute and analyzed the mechanism rigidity vibration of every serial product.
- 1998  The whole serial products of internal grinder, centerless grinder and CNC cylindrical grinder were approved by the German SGS verification, and acquired the CE safety Certificate, MD, LVD and EMC Certificate.
- 1999  The founder, Mr. C.T. Cheng, succeed as chairman.
- 1999  Cooperated with Sun Yat-sen Science Research Institute and Chung Yuan Christian University, successfully developed the first internal & cylindrical compound grinder in Taiwan.
- 1999  Suffered 921 earthquake disasters, one of the workshops and office collapsed. The recovering work was done within one month.
- 2000  Developed CNC centerless grinder compounding with automatic loading and unloading device, on-line automatic measurement and automatic compensation system.
- 2000  Announced Taiwan first CNC GT-600 grinder special designed for aircraft turbo-engine Vane entrusted by Singapore Aerospace Industry Company.
2001  Announced RHC-630CNC heavy-duty centerless grinder and distributed to bearings manufacturing and adopted by Taiwan Tung Pei Industrial Co., Ltd.


2002  Developed CNC centerless grinder combining FANUC ROBOT automatic loading and unloading whole time producing system.

2002  Start to provide the world-wide famous auto parts supplier, Delphi India, CNC angular cylindrical grinder.

2003  Cooperated with Sun Yat-sen Science Research Institute and Chung Yuan Christian University to fulfill the development of high speed CNC internal grinder combining with linear motor.

2003  Purchased Mitsui Seiki super precise CNC machine center, Zeiss coordination measuring machine, vertical CNC grinding machine and compound lathe, etc equipments.

2003  Acquired the ISO9001 certificate of international quality management system.

2004  Suffered the historic calamity of 72 flood disaster and had nevertheless recovered within 4 months, the first grinder was sold finally.

2005  Finished the development of CNC internal grinder integrating auto FANUC ROBOT manipulator and the online auto measurement whole time producing system.
History

- 2005  RHC-630CNC acquired the symbol of excellence awarded by the Ministry of Economic Affairs of Taiwan.
- 2006  Moved to Tanzi new plant of 16500 square meters equipped with air condition.
- 2006  Announced new technique of hydrodynamic and hydrostatic hybrid bearing, and applied on CNC cylindrical grinder.
Working Environment

- Tanzi Factory (16500 m²): Major office and manufacturing base
- Dongping Factory (6000 m²): Preprocess and storage for castings and sealguard
- Xinping Factory (700 m²): Precision and finish machining for major parts
Quality Control

- Input Quality Control
- In-Process Quality Control
- Output Quality Control
Major Measurement Instruments

- Laser Interferometer (Renishow)
- Three-Coordinate Measuring Machines (Zeiss and Brown&Sharpe)
- Roundness Tester (Hommel and Taylor-Hobson)
- Contour Tester (Hommel)
- Roughness Tester (Hommel)
- Hardness Tester (Misawa Seiki)
- Precision Digital Micrometer (Mitutoyo)
- Laser Micrometer (Aeroel)
Major Measurement Instruments

Three-Coordinate Measuring Machine

Contour Tester
Major Measurement Instruments

Roundness Tester

Laser Micrometer
Parts Machining Equipments & Processes

- Major Precision Machining Equipments:
  - High Precision Horizontal Machine Center (MITSUI SEIKI)
  - High Precision Vertical Grinding Machine (TAIYO KOKI)

- Machining Processes
  - Normalized, tempered, carburized hardening, sub-zero treatment, and then follows the precision grinding.
  - Vibration Stress Release for Machine base and major parts.
Major Machining Equipments

High Precision Machine Center
(MITSUI SEIKI)

High Precision Vertical Grinding Machine
(TAIYO KOKI)
In-Process Quality Control

Handscraping

Laser Interferometer
IPQC / OQC Records and Reports

- IPQC Records
- Precision and Accuracy Inspection Reports
- Geometric Dimensioning & Tolerancing Measurement Reports
GD & T Measurement Report

Geometric Dimensioning & Tolerancing
Measurement Report

Series: CNC Universal Cylindrical Grinding Machines
Model: GU-3250CNC
Machine No.: CNC050103
Customer: DELPHI TVS DIESEL SYSTEMS LTD. (INDIA)
P.O. Number: Grinding Test
Inspector: Amy Lin
Supervisor: John Wu
Date(Y/M/D): 2008/01/09
GD & T Measurement Report
International Certificates
- CE, SGS, ISO 9002, ISO 9001
Patents

- 184645 : Automatic Grinding Wheel Dresser for Sphere and Ball Socket
- 174117 : Pneumatic Arrangement Conveyor for Small Parts
- 217833 : Crankshaft fixture for cutting pins with eccentricity adjuster
- M274716 : Separate Type and Rolling Type Waterproof Device for Slideway of Machine base
- M307704 : Teeth Labyrinth Twin-shaft Seal Device for Spindle of Centerless Grinding Wheel
- M307690 : A Protect Device for Bearing by Retaining Pressure as Power Cut Off of Oil Supply

Filings:
- The Pneumatic Device for Lifting Cover by Using Gear Rack
- Sealing Device for Detector of Shaft Surface
- Air and Liquid Compound Cooling Device for Temperature Control of Spindle and Bearing
Products Lineup

- Centerless Grinding Machines (E/B/H/CNC)
- High-Speed Centerless Grinding Machines (B/CNC)
- Internal Grinding Machines (E/NC/CNC)
- Twin-spindle Compound Grinding Machines (CNC)
- Universal Cylindrical Grinding Machines (S/P/NC/CNC)
- Angular Cylindrical Grinding Machines (CNC)
- Special Designed Grinding Machine
Centerless Grinding Machines

- The grinding and regulating wheel spindles are made of high quality alloy steel (SNCM-439), and treated through: normalized, tempered, carburized hardening, sub-zero treatment, and then follows the precision grinding process which can greatly enhances spindle life and stability guaranteeing deformation free performance.
- The unique hydrostatic bearings of the grinding wheel and roller bearing of regulating wheel can reduce the metal friction.
- Along with vibration stress release, these outstanding structural features assure high strength, maximum damping capability, and longer service life.
- Total solution. Automatic loading and unloading grinding process design.
Centerless Grinding Machines  
- Economic Series

G.W. Hydrodynamic Sliding Bearings

R.W. Hydrodynamic Sliding Bearings
Centerless Grinding Machines
- B Series (R.W.: Ball and Roller Bearings)
Centerless Grinding Machines
- H Series (G.W.: Hydrostatic Sliding Bearings + B series)
Centerless Grinding Machines - CNC Series

- Equipped with FANUC color screen, the latest technology in digital control systems.
- Equipped with B series bearings (Roller bearing R.W + Hydrodynamic bearing G.W).
- Available with H series bearings (Roller bearing R.W + Hydrostatic bearing G.W).
- The combination of 1-6 Axes with servo motor.
High-Speed Centerless Grinding Machines

- The innovative advanced regulating wheel spindle does not require a flange and utilizes angular contact bearings and cylindrical roller bearings with double supports that firmly maintain spindle super precision rotation and rigidity.

- Grinding wheelhead cover can be lifted by hydraulic cylinders that can easily and quickly change grinding wheel.

- Equipped with FANUC color screen, the latest technology in digital control systems.
High-Speed Centerless Grinding Machines
- RHC 620B/620CNC

- Max. peripheral speed up to 3000m/min
- Grinding Wheel ø 610 * 205 * 304.8 mm
- Roller and ball bearings are available both on R.W.
- CNC Series is equipped FANUC CNC controller.
High-Speed Centerless Grinding Machines
- RHC 630B/630CNC (Heavy-Duty)

- Designed for workpieces up to ∅ 200mm
- Extra large grinding wheel ∅ 610 * 305 * 304.8 mm
- Roller and ball bearings are available both on G.W. and R.W.
- CNC Series is equipped with roller and ball bearings and CNC controller.
- Eliminate Backlash Device: has weights combined with counterweight on the side of track to reduce the backlash between ballscrews to increase micro feed accuracy.
Internal Grinding Machines

- Nimble and precise positioning wheelhead.
- Multi-function and manual adjustable workhead.
- Highly rigid machine base with hydrostatic lubrication on guideways on Z axis.
- Heidenhain sub-μ Linear scale with closed-loop feedback on X axis.
Internal Grinding Machines
- Economic Series

- Hydraulic driven automatic wheel infeed.
- Hydraulic lubrication features low friction coefficient, and is pretensioned for increased rigidity and high positioning accuracy.
- Angular contact ball bearing in wheelhead handles both axial and radial loads to maintain the stability of high precision during high-speed rotation.
Internal Grinding Machines
- NC Series

- NC Series Dialogue type interface, the latest graphic control and digital control technology.
- Self diagnostic function for trouble shooting.
- Automatic memory while power failure.
- Memory function of infeed and dressing compensation.
- Multi-dressing can be set up during grinding.
- Dressing compensation can be adjusted on-line.
Internal Grinding Machines - CNC Series

- Equipped with FANUC color screen, the latest technology in digital control systems.
- The table motion is driven by servo motor to ensure high rigidity and precise positioning.
- X and Z axes have high torque servo motor directly coupled to the class C1 ballscrew.
Twin-spindle Compound Grinding Machines

- Configuration for internal and cylindrical grinding in one machine to eliminate repetitive chucking error of workpiece. Guarantee accuracy, circularity and concentricity!
- Upgrading production efficiency up to 40%! Without re-setup workpiece from internal grinding to cylindrical grinding.
- Cost Down for equipment investment! One machine can meet your requirement of internal and cylindrical grinding.
- Maximum 10 faces grinding in one cycle.
Twin-spindle Compound Grinding Machines - CNC Series

Axes

Grinding faces
Twin-spindle Compound Grinding Machines
- Grinding Patterns
Universal Cylindrical Grinding Machines

- Grinding wheelhead spindle with unique Hydrostatic Bearings
- Multi-function, high roundness Workhead
- Hydraulic and manual adjustable Tailstock
- High rigid Machine Base with Hydrostatic Lubrication on guideways
- Heidenhain sub-μm Linear Scale with closed loop feedback.
Universal Cylindrical Grinding Machines
- S / P series (GU-32)

- S series is manual wheel infeed.
- P series is hydraulic driven automatic wheel infeed.
Universal Cylindrical Grinding Machines - NC series(GU-32)

- Swing Over Table: 320mm
- Max. Load Held Between Centers: 150KGS
- Grinding Wheel Peripheral Speed: 33m/sec
- Max. Workpiece Diameter to be Ground: $\phi$ 280mm
- Distance between Centers: 500mm/750mm/1000mm
Universal Cylindrical Grinding Machines
- CNC series (GU-32/GU-20)

- Equipped with FANUC color screen, the latest technology in digital control systems.
- X/Z axes have high torque Servo Motor directly coupled to the class C1 Ballscrew (⌀ 40mm)
Angular Cylindrical Grinding Machines - CNC series (GA-35/GA-20)

- Equipped with FANUC color screen, the latest technology in digital control systems.
- Grinding wheelhead spindle with unique hydrostatic bearings / hydrodynamic and static hybrid bearings (hybrid bearings).
- Multi-function, high roundness Workhead.
- Hydraulic and manual adjustable Tailstock.
- High rigid Machine Base with Hydrostatic Lubrication on guideways.
- Heidenhain sub-μm Linear Scale with closeloop feedback.
- X/Z axes have high torque Servo Motor directly coupled to the class C1 Ballscrew (⌀40mm).
Angular/Plunge Cylindrical Grinding Machines - Heavy-duty CNC series (GAH/GUH-35)

- X-axis and Z-axis greater span of guideways afford larger load capacity than GA/GU CNC Series.
- Time-saving and high efficiency in cycle and setup.
- Larger grinding wheel spindle. (∮ 115x741mm)
- Z-Axis class C1 ballscrew is temperature controlled by circulating coolant achieving minimum thermal displacement effect and greater accuracy.
- Rigid and precise hydrostatic-hydrodynamic hybrid bearings on angular wheelhead.

[Image of PARAGON GAH-3540CNC machine]
Special Designed Grinding Machine

GT-600CNC

Aircraft turbo-engine vane
Total and Customized Solutions

- Free technical consultation & trial grinding report
- Propose the most suitable machines and accessories
- Customized design
- Comprehensive machine commissioning
- Unparalleled, Choice CNC Grinding Solution
Universal Cylindrical Grinding Machines
- Automatic loading and unloading
Universal Cylindrical Grinding Machines - Match Grinding
Internal Grinding Machines
- Twin-hole high-speed fixture and CBN dressing rest
Internal Grinding Machines
Rotary-type Dressing Unit (For Diamond Grinding Wheel)
Centerless Grinding Machines
- Automatic infeed loading and unloading devices

Automatic infeed loading device

Auto-unloading device
Universal Cylindrical Grinding Machines
- Magnetic chucking for tiny workpiece
Angular Cylindrical Grinding Machines
- Large end-face grinding
Internal Grinding Machines
- RIG150CNC with Robot Arm
Universal Cylindrical Grinding Machines
- GU-3250CNC with Robot Arm
Sales Network

Thousands PARAGON customers in more than 40 countries around the world.
Major Worldwide Customers 2/8

- BORGWARNER MORSE TEC (INDIA)
- DEUSCH DAGAN LTD.
- DELPHI-TVS DIESEL SYSTEMS LTD. (INDIA)
- CHEESIANG SEWING MACHINERY (S.H.) CO., LTD.
- CMT INDUSTRY CO., LTD.
- CERATIZIT SOUTH CAROLINA, INC.
- DAEIL AUTOMOTIVE PARTS CO., LTD.
- DELPHI AUTOMOTIVE SYSTEMS LTD. (INDIA)
- DEUSCH DAGAN LTD.
Major Worldwide Customers 3/8

- ESCORTS LIMITED
- GUHRING INC.
- FOXCONN TECHNOLOGY CO., LTD.
- GERIMEX BV
- FAIR-RITE PRODUCTS CORP.
- GAMAK MAKINA SANAYI
- NITTAN VALVE CO., LTD.
- TOKICO AUTOMOTIVE SUZhou CO., LTD.
- GREENFIELD INDUSTRIES
- HARRISON SPORTS, INC.(U.S.A)

PARAGON
since 1968
Unparalleled, Choice CNC Grinding Solutions
Major Worldwide Customers 4/8

HI-TECH GEARS LTD.

HANITA METAL WORKS LTD.

INGERSOLL RAND

INNOVALUES PRECISION CO., LTD.

IM GEARS PVT LTD. (INDIA)

INOAC INTERNATIONAL CO., LTD. (JAPAN)

IP RINGS LTD. (INDIA)

ISCAR LTD.

JENG FENG GROUP

JOHNSON ELECTRIC INDUSTRIAL MANUFACTORY LTD.
Major Worldwide Customers 5/8

JOHNSON HEALTH TECH GROUP
KERN-LIEBERS USA, INC
KAYABA (MALAYSIA) SDN. BHD.
KIP COMPANY, INC.
KONEKS A.S. (TURKEY)
LUNG KEE GROUP
LUCAS TVS LIMITED
MIZUNO CORPORATION
MASPION GROUP
MAINI PRECISION PRODUCTS (INDIA)
Major Worldwide Customers 6/8

- MICRO SWISS
- MICRO TOOLS LTD.
- MAHLIE TRI-RING VALVE TRAIN (HUBEI)
- NANJING TRI-M SPECIAL METALS CO., LTD.
- NTA MACHINING (M) SDN. BHD.
- NIDEC SINGAPORE PTE LTD.
- NOK ASIA CO. PTE LTD. (SINGAPORE)
- NOTION VENTURE SDN. BHD.
- OTTO BILZ (INDIA) PVT. LTD.
- OKUN KONEISTUSPALVELU OY
Major Worldwide Customers 7/8

- PUNCH INDUSTRY(DALIAN) CO., LTD.
- PRINCE INDUSTRIES INC.
- PANASONIC HOME APPLICATIONS
- PILOT TOOLS (PTY) LTD.
- POLYAX KFT.
- RIGHT WAY INDUSTRIAL (MALAYSIA) SDN. BHD.
- RANE ENGINE VALVES LTD.
- SANYO ELECTRIC CO., LTD.
- SYNTURN(M) SDN. BHD.
- SPINDEX INDUSTRIES LIMITED
Major Worldwide Customers 8/8

- Shimano (Singapore) PTE LTD.
- Siam Kayaba Co., Ltd.
- Sundaram Fasteners Ltd. (India)
- Sansera Engineering Pvt. Ltd.
- Shriram Pistons & Rings Ltd.
- TVS Motor Co., Ltd.
- Taiwan Nittan Industrial Co., Ltd.
- UCAL Fuel Systems Limited
- Yilmaz Reduktor A.S.
Welcome to PARAGON