

TOYODA

JTEKT

**GL5i
SERIES**
CNC Cylindrical Grinders

GL5Pi
GL5Ai



<http://www.jtekt.co.jp>

Information presented in this brochure is subject to change without prior notice.
Available machines or machines shown may vary depending on optional equipment or periodic design changes.
The export of products defined as restricted commodities (or technologies) under Japan's "Foreign Exchange and Foreign Trade Act" requires an export license issued by the Japanese Government. Furthermore, similar licenses may be required for re-transfer, re-sale or re-export of such products, therefore please do not fail to contact JTEKT in advance.
In order to observe laws and regulations and prevent inappropriate export, re-sale and relocation, JTEKT has equipped all of our NC machine tools with devices that detect relocation. If this device is activated, the machine will cease operation and will not restart until it has been checked by JTEKT. JTEKT may refuse to restart the machine should it be deemed that such an action would amount to the inappropriate export of a commodity or technology, or violate export regulations. In such a case, JTEKT will not be liable for any damages arising from the refusal to restart machine operation and do not bear any liability to perform services pertaining to product warranty. Please contact your JTEKT representative for details. Always read manuals carefully before using any machinery to ensure safe and proper use.

Type of Machinery: Grinder
Model Number: GL5i

©JTEKT CORPORATION 2014
Cat. No. M2118E

Printed in Japan 141010U
This publication was made using recycled paper for the protection of forests.

JTEKT
JTEKT CORPORATION

JTEKT
Koyo TOYODA

CNC Cylindrical Grinders

GL5Pi
GL5Ai

Optimum cylindrical grinder
for production enabling both
high accuracy and high productivity.



This machine in this photo is GL5Pi-32.
The grinder in this photo has special specifications.
Note: Painting color shall be specified by mutual agreement.

Long-term grinding accuracy

- High rigidity - low vibration bed
- TOYODA STAT BEARING
- Reduction of thermal displacement

High Productivity

- Abundant variation
- Abundant grinding cycles
- All-step grinding due to being driving dog-free **Option**
- Improved productivity through adoption of a CBN wheel **Option**

Reassuring operation

- Improved reliability with TOYOPUC-GC70
- High accuracy filtering coolant unit **Option**



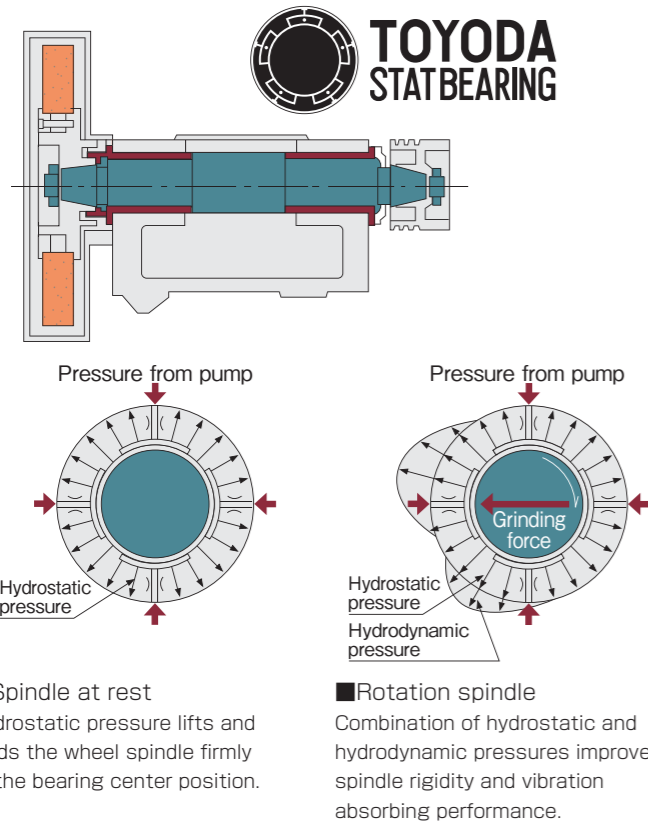
Photo is an example of CBN wheel specification.

Long-term grinding accuracy

High rotation accuracy and feed accuracy

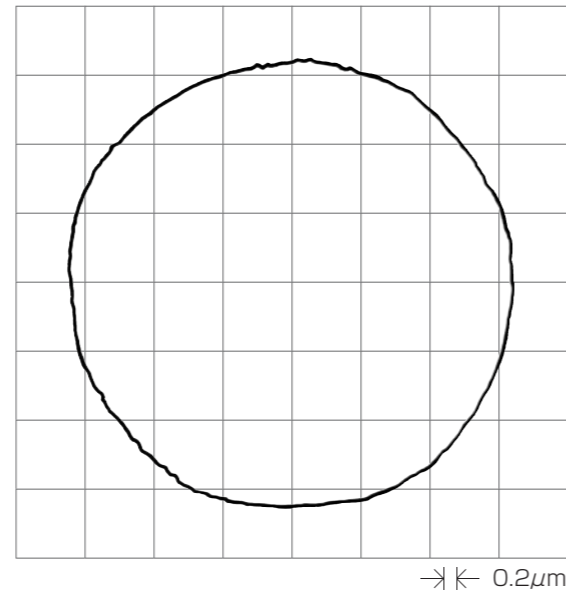
JTEKT's Proprietary TOYODA STAT BEARING

The heart of our wheel spindle is the TOYODA STAT BEARING. This bearing is uniquely designed as a hybrid bearing that combines static and dynamic pressure. Eliminating all metal-to-metal contact in the bearing reduces wear for machining longevity. It also features a highly rigid structure with excellent damping performance, which gives the spindle high rotational accuracy.



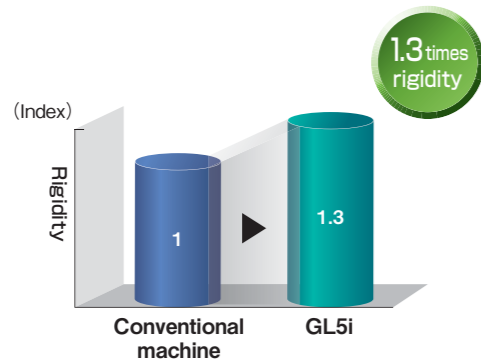
Wheel spindle rotational accuracy
0.016 μ m

An Example of Lissajou's Figure



High rigidity, low-vibration bed

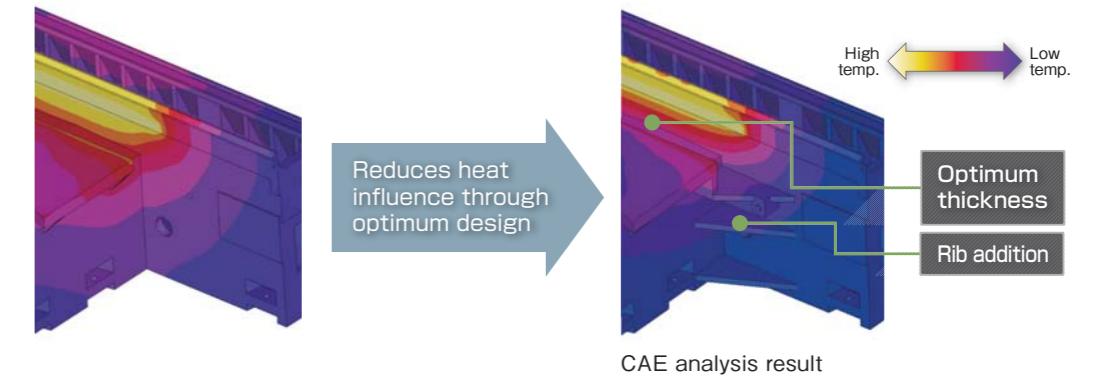
To achieve high-accuracy grinding over a prolonged period, the support bed has been designed and analyzed to provide sufficient rigidity and to suppress unnecessary vibration during grinding.



Reduction of thermal displacement

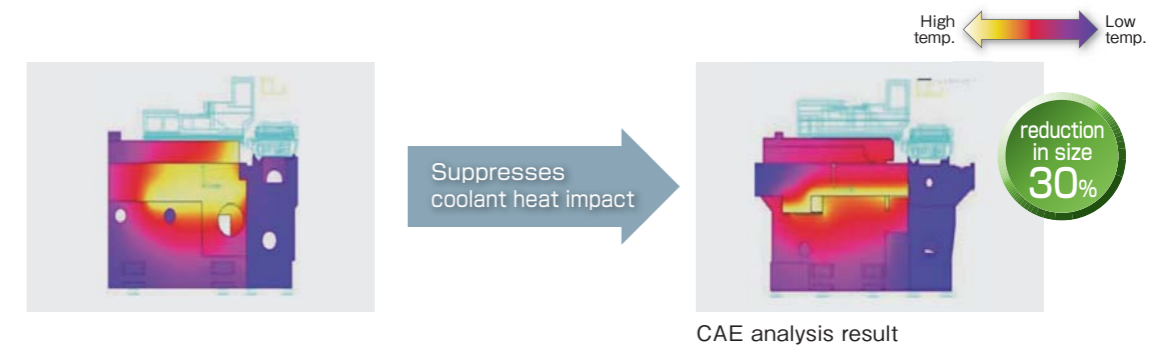
Low thermal displacement bed

Brings ingenuity to the bed shape and rib layout, and minimizes strain caused by room temperature, etc.



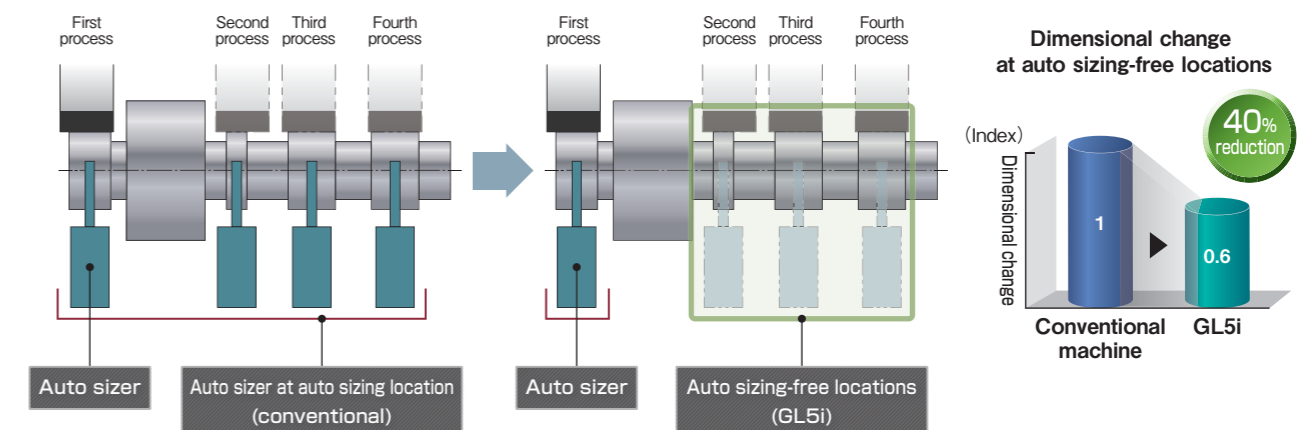
Heat isolation cover

Using CAE analysis, we have achieved a coolant route that is not easily affected by heat. By adding an isolation cover, a layer of air is created between the bed and the coolant route, which reduces the amount of heat that is transferred to the bed.



Achieved auto sizing-free by reducing heat displacement.

Dimensional accuracy of auto sizing-free locations was increased by reducing the heat displacement of the machine base.



High productivity

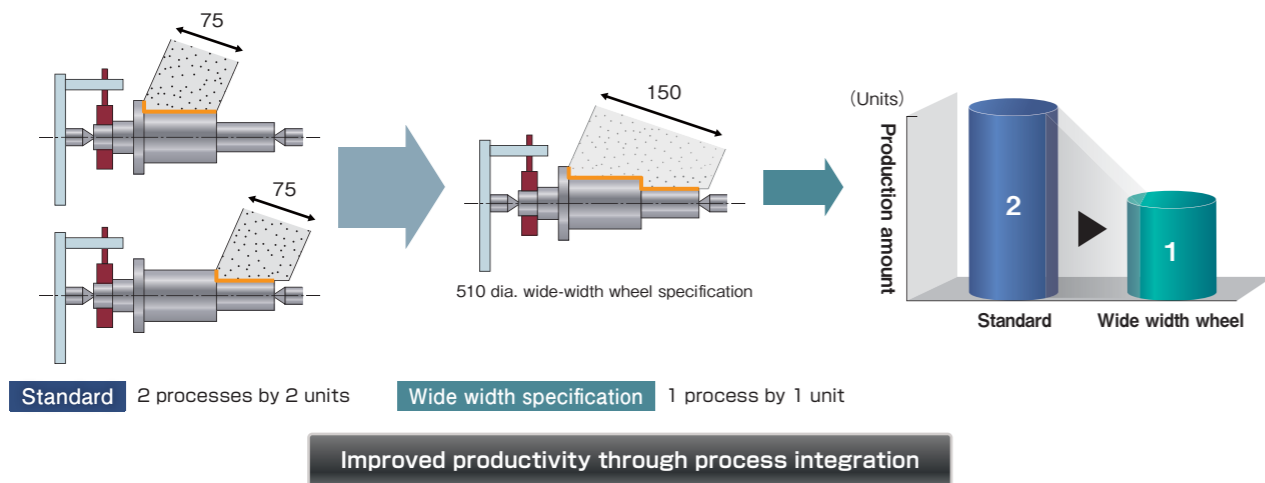
Abundant variation

Wheel	Wheelhead	Type	Wheel OD × max. width × ID (mm)	Swing on table (φ mm)	Distance between centers (mm)
Normal wheel	Straight	GL5Pi	φ510×125 [150] × φ203.2 (φ610×80 [125] × φ304.8)	φ320	250/320/630
	Angular	GL5Ai	φ510×125 [150] × φ203.2 (φ610×80 [125] × φ304.8)		
(CBN wheel)	Straight	GL5Pi	(φ350×50×φ180)		
	Angular	GL5Ai	(φ370×50×φ180)		

(): option [] : wide width wheel specification

High efficiency grinding using wide-width wheel

Two conventional processes were integrated into one process by grinding with a wide-width wheel, reducing the the number of machines.



Abundant grinding cycles

From an abundance of grinding cycles incorporating JTEKT's thorough knowledge of grinding, we propose the ultimate grinding cycle to suit your workpiece. We have many more grinding cycles available apart from those shown below. Please consult with our sales staff for details.

	Plunge grinding	Multi-step plunge grinding	Multi-plunge/traverse grinding
Straight type			
Angular type			

Grinding example

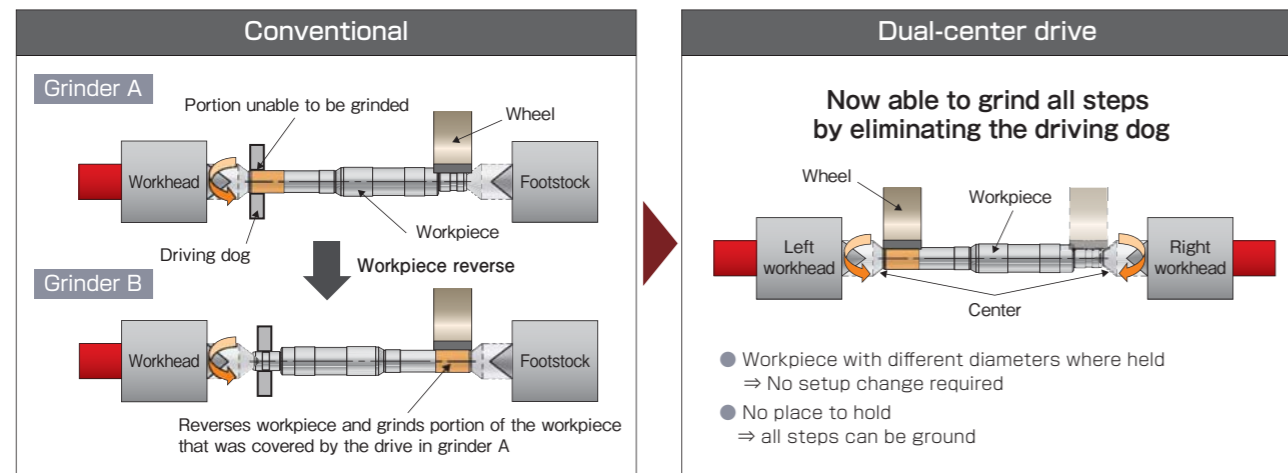
<p>Workpiece to be ground [name] Armature shaft [material] S48C</p>	<p>Workpiece to be ground [name] EPS pinion shaft [material] SCM420</p>
<p>Workpiece to be ground [name] Blank shaft [material] S48C</p>	<p>Workpiece to be ground [name] Divided crank shaft [material] S48C</p>
<p>Workpiece to be ground [name] Gear [material] SCR420</p>	<p>Workpiece to be ground [name] Front hub [material] S40VC</p>
<p>Workpiece to be ground [name] Outer race [material] S45CJ</p>	<p>Workpiece to be ground [name] Camshaft [material] S45C</p>
<p>Workpiece to be ground [name] CVT shaft [material] SCM420H</p>	<p>Workpiece to be ground [name] Drive shaft [material] SCM415</p>

High productivity

Improved productivity with a dual-center drive

Able to grind all steps by eliminating the driving dog **Option**

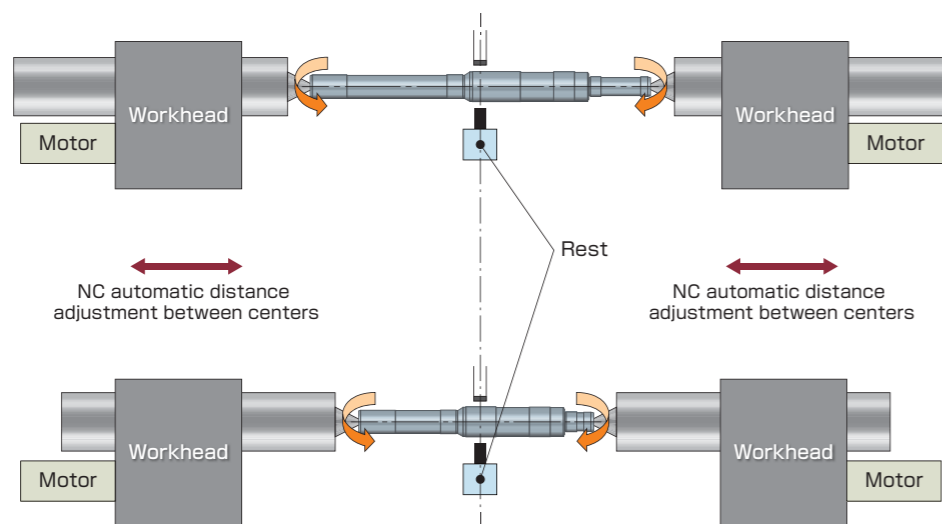
We have prepared a dual-center drive workhead that drives workpieces using the friction force of both centers. With this device, all-step grinding of outside diameters is possible without a driving dog.



No need to perform setup changeover due to difference in workpiece length

Supporting varying workpiece lengths with a function for NC auto distance between-center adjustment. **Option**

Supporting varying workpiece lengths without changing the rest position. This significantly reduces set-up changeover time, contributing to productivity improvement.



Productivity improved with the adoption of a CBN wheel

Merits of CBN wheel usage **Option**

By adopting a CBN wheel, productivity is increased and workability is improved.

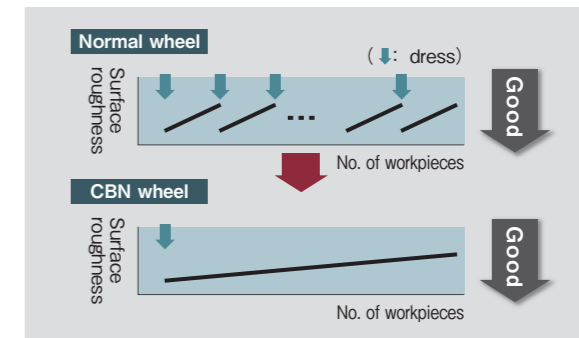
- Reduction of wheel dressing wait time
- Reduction of wheel change frequency
- Less quality check processes associated with wheel diameter change
- Less coolant tank maintenance processes caused by grain infiltration

Comparison of abrasive amount (amount generated in 1 day)



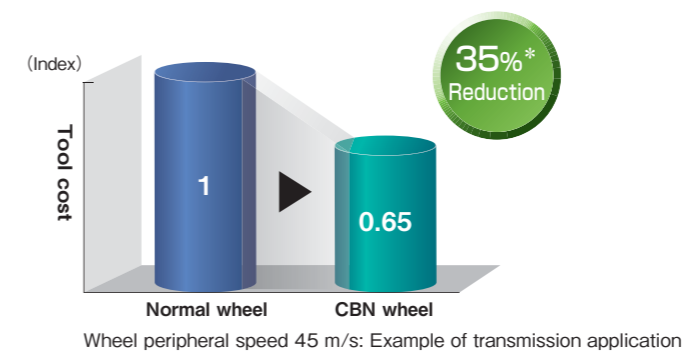
Accuracy improved with the adoption of a CBN wheel

Dimensional accuracy and surface roughness is stabilized due to an extended dressing (wheel dressing) interval.



Wheel peripheral speed options are 45 m/s, 60 m/s and 80 m/s

With the peripheral speed of 45 m/s, the benefits of adopting a CBN wheel are obtained at the same equipment cost as a normal wheel. The peripheral speeds of 60 m/s or 80 m/s achieve further shortening of cycle time.



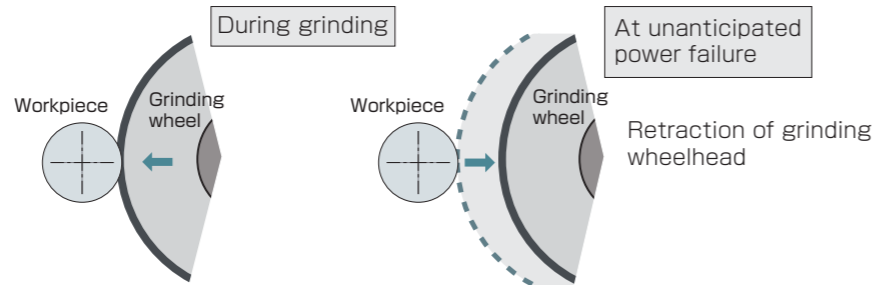
The data listed does not show guaranteed figures.

Reassuring operation

Improved reliability with TOYOPUC-GC70.

Protection against grinding wheel damage during power failure

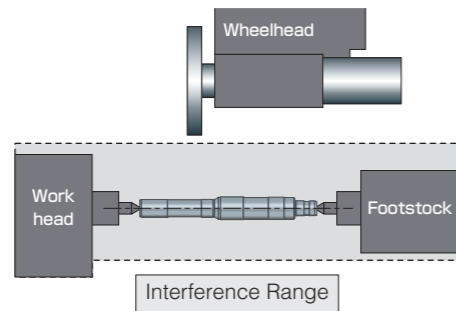
The grinding wheel is separated from the workpiece if a power failure is detected, thereby protecting against grinding wheel damage.



Safety manual handle operation, debugging made easier

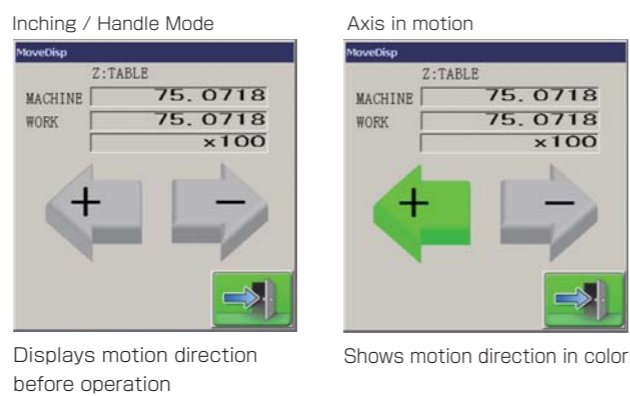
Option

During manual handle operation, automatically changes to low magnification when in the interference range. For initial part grinding, the feedrate in the interference range automatically decelerates to support debugging work.



Prevention of incorrect manual operation

A support function that displays the direction of movement during manual operation and alerts of operational errors is equipped.

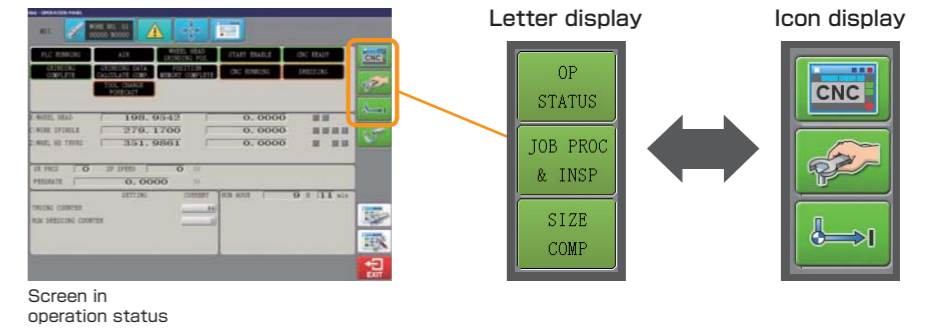


Data batch backup function

Allows the batch saving of all data, including grinding conditions, compensation data, parameters, etc. This function can also be of use in fault analysis of machine stoppage.

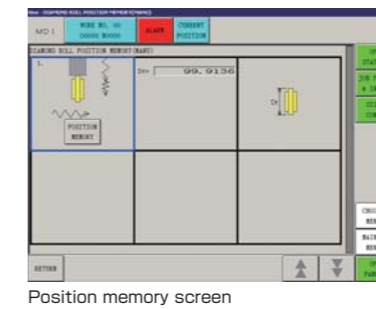
Iconized operation buttons

Operations can be easily recognized through iconized operation buttons. Buttons can be switched from icons to letters.



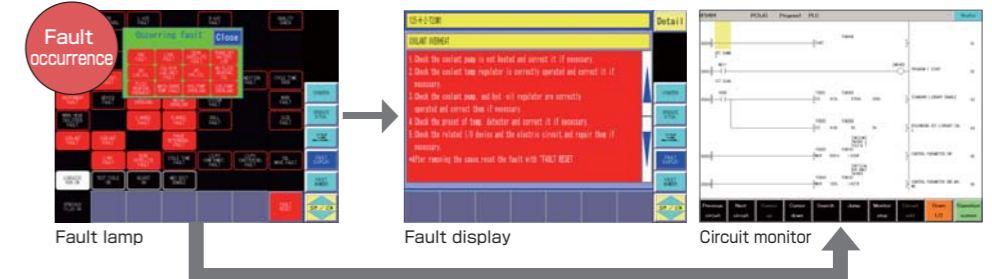
Perfected guidance function

Setup change, maintenance details, input data explanation, etc. can be easily understood from the graphical operation screen, and operations can be carried out smoothly.



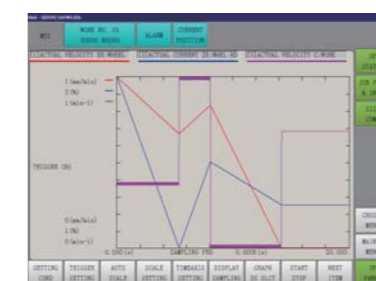
Simple fault diagnostics

Fault locations are diagnosed directly on the CNC screen from the error display and the circuit monitor.



Perfected preventative maintenance support function

Defective workpieces and machine malfunctions can be discovered early by comparing normal values sampled from electrical current, position deviations, speed data, etc.



Reassuring operation

Minimizing grinding faults and equipment breakage through high accuracy filtering at 30 ppm

Option

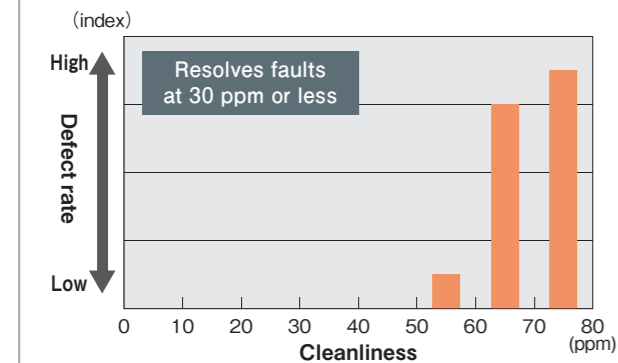


Achieves a cleanliness of 30 ppm by being equipped with a high accuracy magnet separator, and has less grinding defects and equipment trouble.

30 ppm: Equivalent to 30 mg in 1 liter of coolant fluid

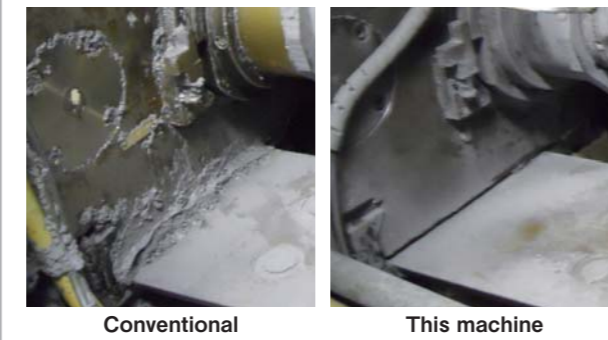
Minimizes grinding faults

Solves grinding defects caused by chip biting on sections making contact with the auto sizer.



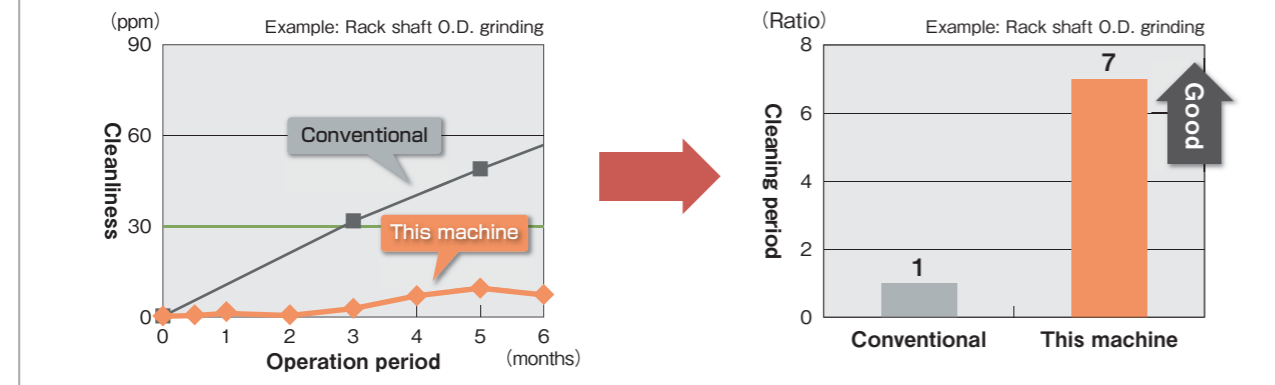
Minimizes equipment breakages

Improves equipment longevity through the reduction of chip accumulation



Longer interval between coolant replacement in the coolant tank

Cleanliness is improved and liquid replacement interval is extended.



Machine specifications

(): option []: wide width wheel specification

Item	Unit	GL5Pi-25	GL5Pi-32	GL5Pi-63	GL5Ai-25	GL5Ai-32	GL5Ai-63	
Distance between centers	mm	250	320	630	250	320	630	
Swing over table	mm	φ320						
Grinding diameter	mm	φ0~220						
Load between centers	kg	150						
Control unit		TOYOPUC-GC70						
Wheel	Normal wheel Specifications OD × width (max.) × ID	mm	φ510×125 [150] × φ203.2 (φ610×80 [125] × φ304.8)		φ510×125 [150] × φ203.2 (φ610×80 [125] × φ304.8)			
	CBN wheel Specifications OD × width (max.) × ID	mm	(φ350×50×φ180)		(φ370×50×φ180)			
	Surface speed	m/s	45 (60, 80)					
Wheelhead	Rapid feedrate	m/min	φ20					
	Minimum input increment	mm	φ0.0001					
Table	Type		United type					
	Rapid feedrate	m/min	20					
	Minimum input increment	mm	0.0001					
Workhead			Fixed axis					
	Center		MT. No. 4 (No.5)					
	Rotation speed	min ⁻¹	22~500					
Footstock			Hydraulic type with manual taper adjustment					
	Center		MT. No. 4 (No.5)					
	Footstock stroke	mm	60					
Electric unit	Wheel spindle	kW	5.5 (7.5) [11]					
	Wheelhead feed	kW	1.3					
	Table traverse feed	kW	1.8					
	Work spindle	kW	1.3					
	Hydraulic oil pump	kW	0.75					
	Lubrication oil pump	kW	0.04					
Tank capacity	Hydraulic oil	L	10					
	Lubrication oil	L	12					
	Wheel spindle bearing oil	L	17					
	Coolant	L	230					
Machine weight	kg	4,000	4,500	5,000	4,000	4,500	5,000	

* The above values may be limited by the equipped accessories and tooling.

TOYOPUC-GC70 CNC specifications

●: Standard □: Optional

Item	No.	Specification	Accessories
Controlled axes	1	X axis (wheelhead feed)	●
	2	Z axis (table feed)	●
	3	Multi axes specification	□
Display unit	4	12 inch color TFT	●
	5	Structured data management	●
File management	6	Maximum of 64 grinding data	●
	7	Process data/each workpiece: 30	●
Coordinate setting	8	Position memory (various type)	●
Compensation function	9	Each step dimension compensation	●
Display	10	Operation monitor	●
	11	Sequence circuit monitor	●
	12	Sequence circuit edit	●
	13	Work procedure	●
	14	Inspection, Maintenance data	●
	15	Metric display	●
	16	Inch display	□
Operation	17	Canned cycle	●
	18	Test cycle	●
	19	Wheel dressing cycle	●
Operation	20	Return cycle	●
	21	In-process startup function	●
	22	Single block	●
	23	Rapid feed override	●
	24	Feed override	●
Auto sizing	25	Grinding step skip	●
	26	Autosizer control section	□
	27	Wheel replacement prediction/min.wheel dia. display	●
Maintenance	28	Self-diagnosis function	●
	29	Alarm history display	●
	30	Batch backup function	●
	31	Servo sampling function	●
Counter (display in the display screen)	32	Production counter	●
	33	Quality check counter	●
Cycle time display (display in the display screen)	34	Processing cycle time	●
	35	Grinding cycle time	●
Others	36	MDI on/off key switch	●
	37	USB flash drive I/F	●
	38	Wheelhead return at power failure	●

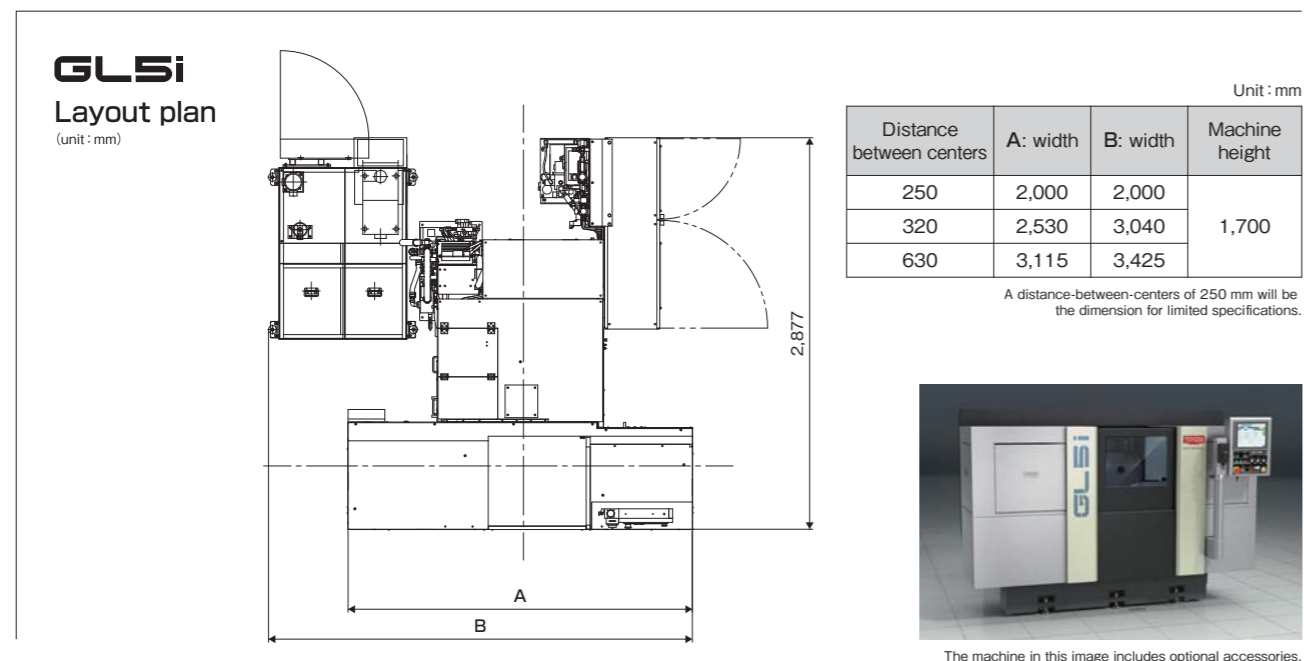
Main accessories specifications

●: Standard accessory □: Optional accessory

Item	Unit name	Included	Item	Unit name	Included
Workhead	Dead center spindle workhead (MT No. 4)	●	Coolant supply unit	Coolant supply unit (tank capacity: 230L, with magnetic separator, processing force: 80L/min)	●
	Dead center spindle workhead (MT No.4 with spindle travel function)	□		High accuracy filtering coolant unit (30 ppm) (tank capacity: 410 L, with magnetic separator, processing force: 95 L/min)	□
	Live center spindle workhead (MT No. 4)	□		High accuracy specification coolant unit (5 ppm) (tank capacity: 370 L, with magnetic separator, processing force: 100 L/min)	□
	Live center spindle workhead (MT No.4 with taper adjustment function)	□		Coolant supply unit with paper filter (tank capacity: 250L, processing force: 80L/min)	□
	Live center spindle both sides drive workhead *1	□		Bed washing unit (with washing pump)	□
	Spindle orientation stop unit	□		Wheel dresser	Wheel dresser for formed single diamond
Footstock	Hydraulic footstock (MT No.4)	●	Wheel dresser for rotary diamond		□
	Manual center distance adjustable type hydraulic footstock (MT No.4)	□	Truing unit (for CBN wheel)		□
	Automatic center distance adjustable type footstock (MT No.4, NC method)	□	CNC unit	JTEKT-made CNC unit TOYOPUC-GC70	●
Wheelhead	Wheel dia. φ510mm specification (normal wheel)	●		Coolant splash prevention cover	Front insertion type
	Wheel dia. φ610mm specification (normal wheel)	□	Manual open/close type (with upper shutter, with window, with close confirmation)		□
	Wheel dia. φ350/370mm specification (CBN wheel)	□	Fully enclosed cover specification manual door		●
	Wheel surface speed 45m/s specification	●	Fully enclosed cover specification automatic door	□	
	Wheel surface speed 60m/s specification	□	Tooling-related devices	Workpiece driving dog	□
	Wheel surface speed 80m/s specification	□		Automatic chuck	□
	Front guard manual adjustment type wheel guard	●		Hydraulic rest unit (mounted on table)	□
	Front guard automatic adjustment type wheel guard	□		Auto sizer for single diameter (JTEKT-made, mounted on table)	□
Variable wheel surface speed unit (inverter control, 3-step switch)	□	Auto sizer for single diameter (JTEKT-made, mounted on bed) *2		□	
Hydraulic /pneumatic	Spindle bearing oil pump unit (wheelhead built-in type, with air cooler)	●	Auto sizer automatically supporting diameter difference (JTEKT-made, mounted on bed) *2	□	
	Hydraulic oil pump unit (with a no-oil check)	●	Automatic lateral locator	□	
	Lubrication oil pump unit (with a no-oil check)	□			
	Oil skimmer	□			
	Pneumatic devices	□			

*1: Contact our sale staff when equipping on GL5i-25. *2: Not provided with GL5i-25.

Machine layout & dimensions



JTEKT JTEKT CORPORATION

NAGOYA HEAD OFFICE

No. 7-1, Meieki 4-chome, Nakamura-ku, Nagoya, Aichi Pref., 450-8515, JAPAN TEL: (81)52-527-1900 FAX: (81)52-527-1911

OSAKA HEAD OFFICE

No. 5-8, Minamisemba 3-chome, Chuo-ku, Osaka, 542-8502, JAPAN TEL: (81)6-6271-8451 FAX: (81)6-6245-3712

SALES & MARKETING HEADQUARTERS

No. 5-8, Minamisemba 3-chome, Chuo-ku, Osaka, 542-8502, JAPAN TEL: (81)6-6245-6087 FAX: (81)6-6244-9007

— GLOBAL NETWORK —

MACHINE TOOLS & MECHATRONICS BUSINESS OPERATIONS

MACHINE TOOLS & MECHATRONICS OVERSEAS SALES DEPT.

1, Asahimachi 1-chome, Kariya, Aichi Pref., 448-8652, JAPAN
TEL: (81)566-25-5171 FAX: (81)566-25-5467

OVERSEAS AFFILIATED COMPANIES

TOYODA MACHINERY USA CORP. HEADQUARTERS
316 W.University Drive,
Arlington Heights, IL 60004
U.S.A.
TEL: (1)847-253-0340
FAX: (1)847-577-4680

TOYODA MACHINERY (DALIAN) CO., LTD. BEIJING OFFICE
Room 1017, Fortune Building No.5 Dong San Huan North Road Chaoyang, Beijing, 100004 CHINA
TEL: (86)-10-6590-9356~58
FAX: (86)-10-6590-9359

TPA ENGINEERING CORP.
84BL-19Lot,
Namdong Industrial Complex,
675-18, Gojan-Dong, Namdong-ku, Incheon, KOREA
TEL: (82)-032-822-0305
FAX: (82)-032-822-0306

TOYODA MACHINERY USA CORP. AUTOMOTIVE PRODUCTS & SPECIAL MACHINES DIVISION
51300 W. Pontiac Trail
Wixom, MI. 48393-1003
U.S.A.
TEL: (1)248-624-5755
FAX: (1)248-624-8597

TOYODA MACHINERY (DALIAN) CO., LTD. SHANGHAI OFFICE
Room 25B3, V-Capital Building 333 Xianxia Road Changning District, Shanghai, 200336 CHINA
TEL: (86)-21-5178-1088
FAX: (86)-21-5178-1099

TOYODA MACHINERY S.E. ASIA CO., LTD.
313, Bangna-Trad Road, KM.1 Kwang Bangna, Khet Bangna, Bangkok, 10260 THAILAND
TEL: (66-2)361-8250~1
FAX: (66-2)361-8252

TOYODA MACHINERY AND ENGINEERING EUROPE SAS
2 Grande Allee P.A des Petits Carreaux
94380 Bonneuil sur Marne, FRANCE
TEL: (33)1-49.56.85.80
FAX: (33)1-43.77.47.50

TOYODA MACHINERY (DALIAN) CO., LTD. FOSHAN OFFICE
2 Wushaxinhui Road, Daliang Street Shunde District, Foshan, Guangdong, 52833 CHINA
TEL: (86)-757-2232-6651~52
FAX: (86)-757-2232-6650

PT.JTEKT INDONESIA
MM2100 Industrial Town
Jl. Halmahera Block DD-3
Cikarang Barat, Bekasi 17520 INDONESIA
TEL: (62)21-8998 3275
FAX: (62)21-8998 3274

TOYODA MACHINERY EUROPE GmbH HEADQUARTERS
Bischofstr, 118 47809 Krefeld GERMANY
TEL: (49)2151-5188-300
FAX: (49)2151-5188-333

TOYODA MACHINERY (DALIAN) CO., LTD. HEADQUARTERS
46 Developing Zone In DaLian, 116600 China
Dalian, CHINA
TEL: (86)-411-8733-4601
FAX: (86)-411-8733-4602

TOYODA MACHINERY (DALIAN) CO., LTD. CHONGQING OFFICE
14-2Room, Block 3, Jinkai Sincere Center, Jinkai Road68#, Northern new District, Chongqing, 401121 CHINA
TEL: (86)-23-6305-6070
FAX: (86)-23-6305-6077

TOYODA KOKI DO BRASIL INDUSTRIA E COMERCIO DE MAQUINAS, LTDA.
Alameda Ulderico Ferrari, 100,
Itaim Guacu, Itu, SP 13312-655, BRASIL
TEL: (55)4023-1730

TOYODA MICROMATIC MACHINERY INDIA LIMITED
506-507, 5th Floor, Suncity Business Tower, Golf Course Road, Sector-54
Gurgaon-122002, Haryana, INDIA
TEL: (91)-124-4264602
FAX: (91)-124-4288355