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— GLOBAL NETWORK —
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Available machines or machines shown may vary depending on optional equipment or periodic design changes.

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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: GE4i

GE4i SERIES

CNC Cylindrical Grinders
/ CNC Internal Grinders

GE4Pi
GE4Ai
GE4Pi-PRO
GE4Ai-PRO
GE4Pi-INTER



CNC Cylindrical Grinders

GE4Pi GE4Ai

Taking highly accurate and user-friendly grinding to a new level



The machine in this photo is GE4Pi-50. The machine shown includes optional accessories such as the special full cover specification and machine front handle specification.

Long-term grinding accuracy

- TOYODA STAT BEARING
- High rigidity, low vibration bed
- High-accuracy feed mechanism
- Low thermal displacement bed
- Heat isolation cover

Simple and easy operation

- Displaying craftsmen skill - that is manual intervention
- Improved efficiency of single part grinding
- Conversational controls allow for ease of use
- HMI TOYOPUC-Touch of the IoT* era

Consideration of safety, reassurance and workability

- Excellent workability with a full cover
- Manual operations are possible with front face handle

Rather than "IoT", JTEKT utilizes "IoT" ("Internet of Everything"), in which people, objects, information, and services are interconnected.

CNC Cylindrical Grinders

GE4Pi-PRO GE4Ai-PRO

Specifications created by professionals, utilizing expert craftsmanship

Pursuing ease of operation - Professional handle

- + Achieves hydraulic machine operability using an NC machine
- + Customizable front operation panel

Enables high grade "monozukuri" that can be achieved by any operator

- + Improved efficiency for single-part grinding
- + Specialized screen display for handle operations



P. 19

The machine in this photo is GE4Pi-50PRO.

CNC Internal Grinders

GE4Pi-INTER

Internal grinding specifications with the same user-friendliness of an external grinder

Same operational feel as external grinders

- + Reduction of operational / learning time
- + Prevention of hazardous events due to differences between internal and external grinding

Improved safety and workability

- + Easy measurement of inner diameter due to wheelhead retreating after machining

Professional specifications leveraging expert craftsmanship

- + Professional handle **Option**
Please see page 19
*However, button arrangement, etc. differs to the description



P. 31

The machine in this photo is GE4Pi-50INTER.

Long-term grinding accuracy

Original **high-accuracy technology** is possible because of JTEKT's extensive grinding machine knowledge and experience.

With years of experience as a top grinder manufacturer and the sophisticated technical prowess of our Research and Development Department which analyze and evaluate automotive parts, bearings and machine tools, this grinder incorporates high-accuracy technology that only JTEKT can provide.

Our approach to achieving high-accuracy grinding

High rotation accuracy and feed accuracy

- [**TOYODA STAT BEARING**] A wheel spindle with high rotation accuracy that uses a hydrostatic and hydrodynamic bearing structure
- [**High rigidity, low-vibration bed**] Suppresses vibration while maintaining rigidity
- [**High-accuracy ballscrew with an increased diameter**] Feed mechanism allow for higher rigidity
- [**Floating plate**] Absorbs ballscrew runout to maintain accuracy and positioning
- [**High-quality scraping**] Prolongs stability of feed accuracy

Reduction of thermal displacement

- [**Low thermal displacement bed**] Reduces the impact of thermal displacement caused by variation in room temperature
- [**Heat isolation cover**] Suppresses the impact of coolant
- [**Coolant flow channel optimization**] Suppresses the impact of coolant heat
- [**Wheel spindle with improved heat-release properties**] Suppresses the impact of machine-generated heat

For customers pursuing even higher accuracy

Packages to suit your accuracy requirements

- [**Thermal displacement correction sensor**] Directly measures and compensates the stretch between wheelhead and table Option
- [**High-cleanliness type unit of coolant supply**] Achieving a cleaning level of 5 ppm Option

Built-in technology achieves high-accuracy grinding



Bed scraping



Main equipment assembly

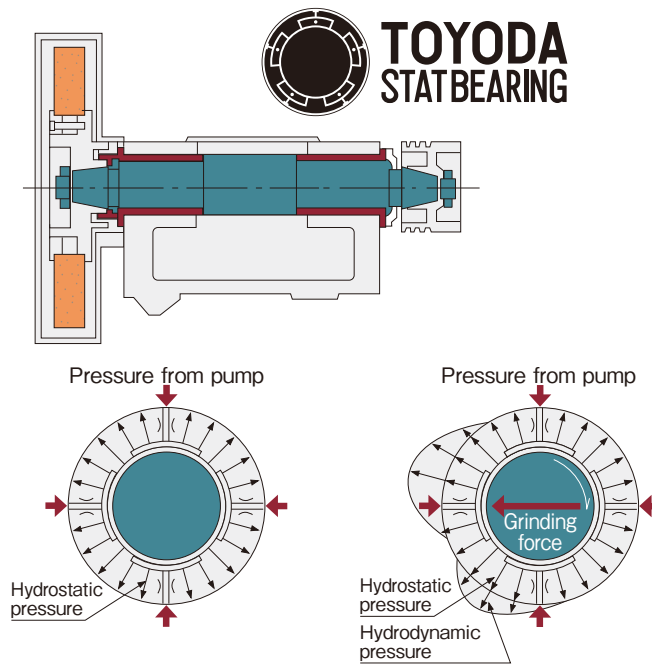


Inspection

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.

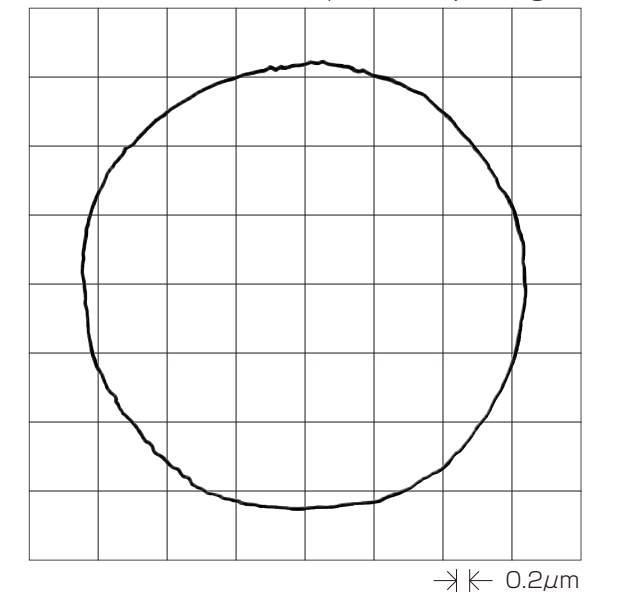


■ Spindle at rest
Hydrostatic pressure lifts and holds the wheel spindle firmly at the bearing center position.

■ Rotation spindle
Combination of hydrostatic and hydrodynamic pressures improves spindle rigidity and vibration absorbing performance.

Wheel spindle rotational accuracy
0.016μm

An Example of Lissajou's Figure



High rotation accuracy and feed accuracy

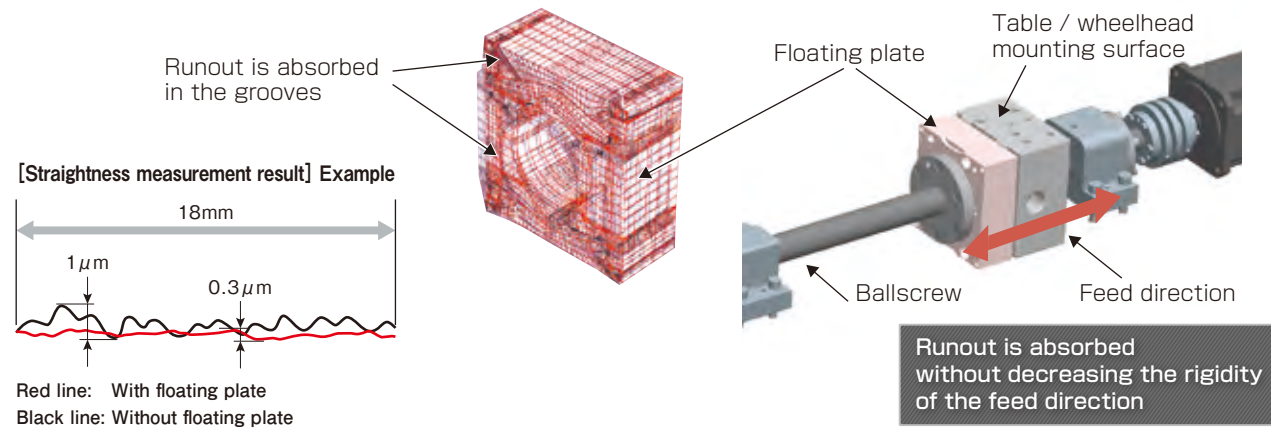
High rigidity, low-vibration base

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.



High-accuracy feed mechanism

By making the ballscrew thicker and more rigid, we have reduced the error in the feed direction. Moreover, a floating plate has been adopted on the wheelhead and table to absorb ballscrew runout. By absorbing runout while maintaining rigidity of the feed direction, high feed accuracy and improved straightness and surface integrity has been achieved.



Master hand scraping

So that our customers may use our machine for an extended period of time with peace of mind, our expert technicians perform "scraping" on both the wheelhead slide and table slide.

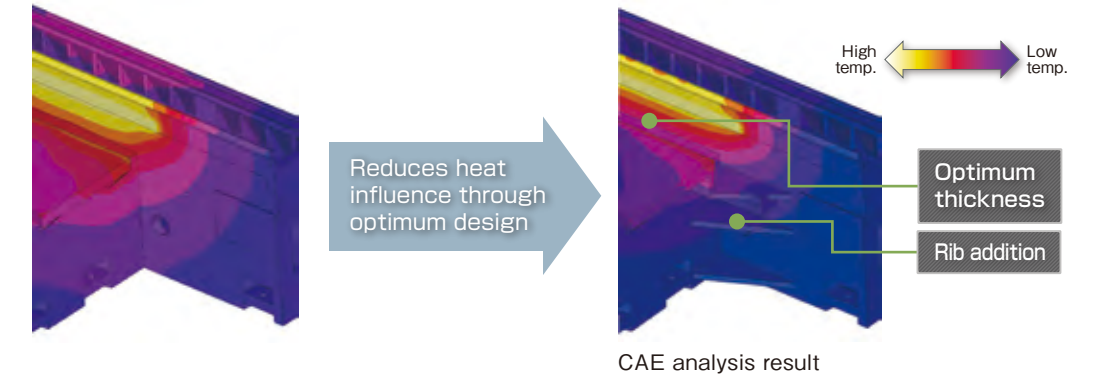
This achieves high straightness, prevents wear of sliding faces and high-accuracy grinding, as well as enables accuracy to be maintained over the long-term.

Moreover, performing scraping on not only sliding portions, but also the upper side of the table and table mating face achieves stable movement of the spindlehead and tailstock, as well as the long-term stability of table swing.

Reduction of thermal displacement

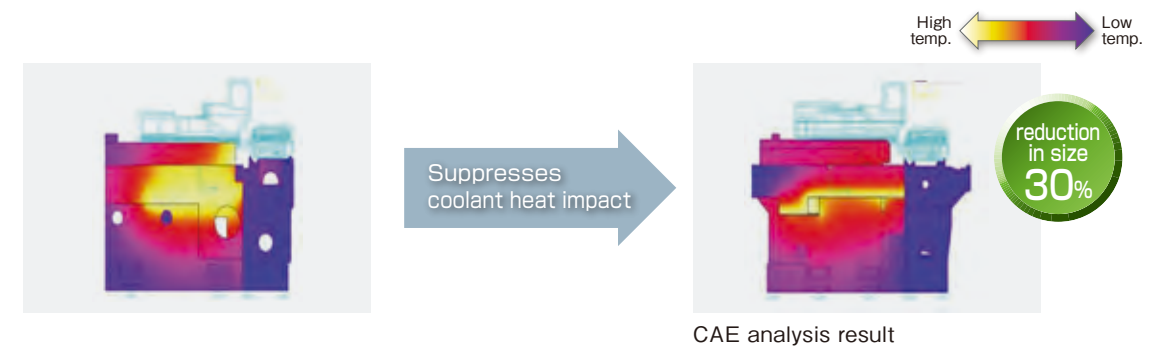
Low thermal displacement bed

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



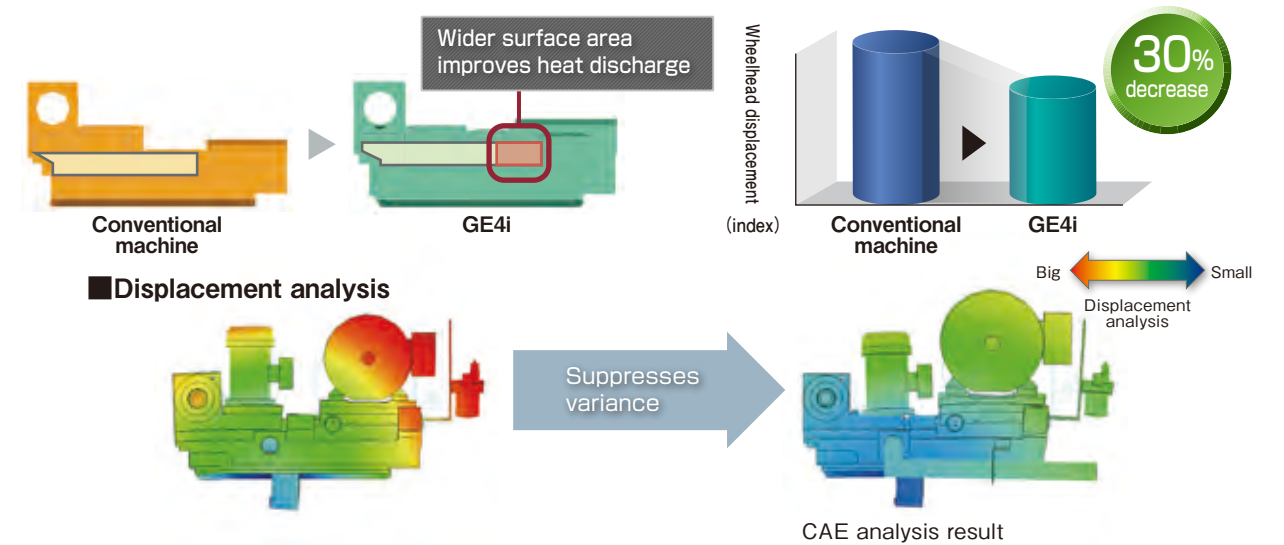
Heat isolation cover

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.



Wheel spindle with improved heat-release properties

The wheelhead's heat release property reduces the temperature elevation of the bearing oil.



For customers pursuing even higher accuracy

Multiple accuracy package options to fit your needs

* GE4PI-INTER cannot be selected

1 Standard package

Standard base specifications

TOYODA STAT BEARING
Floating plate
Isolation cover, etc.

1. Wheel spindle bearing oil pump unit on the wheelhead, wheel spindle bearing oil fan cooler
2. Coolant supply unit (150 liter)

2 High-accuracy support package A

Standard base specifications

(excluding wheel spindle bearing oil pump unit on the wheelhead, wheel spindle bearing oil fan cooler and coolant supply unit (150 liter) from standard package)

TOYODA STAT BEARING
Floating plate
Isolation cover, etc.

1. Wheel spindle bearing oil pump unit (separate installment)
Wheel spindle bearing oil cooler (separate installment)
2. Coolant supply unit (350 liter, washing pump, coolant cooling, magnetic separator processing ability: 80 liters/min (ferrite type))
3. Bed/table washing
4. Cooling of wheelhead and workhead coolant

3 High-accuracy support package B

Standard base specifications

(excluding wheel spindle bearing oil pump unit on the wheelhead, wheel spindle bearing oil fan cooler and coolant supply unit (150 liter) from standard package)

TOYODA STAT BEARING
Floating plate
Isolation cover, etc.

1. Wheel spindle bearing oil pump unit (separate installment)
Wheel spindle bearing oil cooler (separate installment)
2. Coolant supply unit (350 liter, washing pump, coolant cooling, magnetic separator processing ability: 80 liters/min (ferrite type))
3. Bed/table washing
4. Cooling of wheelhead and workhead coolant

1. Servo motor cooling
2. Wheelhead linear scale
3. Thermal displacement correction sensor*
* Only P (straight type)

Standard package

- GE4i - an advanced version of its predecessor.
- Standardly equipped with low thermal displacement bed, isolation cover, coolant route optimization, and other features for stabilizing accuracy.

High-accuracy support package A

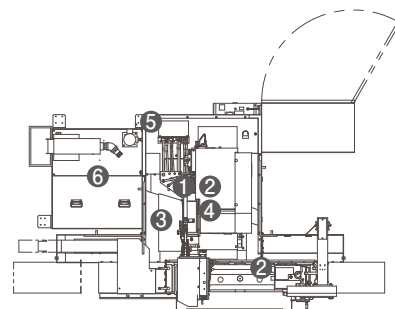
- For customers pursuing even higher accuracy, we recommend this package for faster dimensional stabilization and for a decrease in warm-up time.
- Suppresses torsion through cooling of the workhead and improves cylindricity.

High-accuracy support package B

- For customers pursuing an even higher level of accuracy, we recommend this package, which assists in maintaining stable dimensional accuracy from a cold start.
- Prolonged traverse grinding has been optimized with the use of highly accurate linear scales.

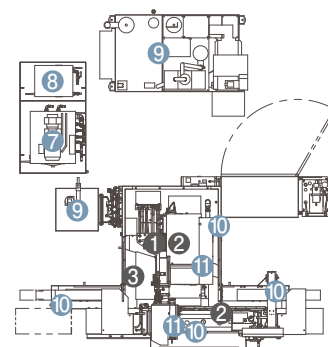
Standard package

- ① TOYODA STAT BEARING
- ② Floating plate
- ③ Isolation cover
- ④ Wheel spindle bearing oil pump unit on the wheelhead
- ⑤ Wheel spindle bearing oil fan cooler
- ⑥ Coolant supply unit (150 liter)



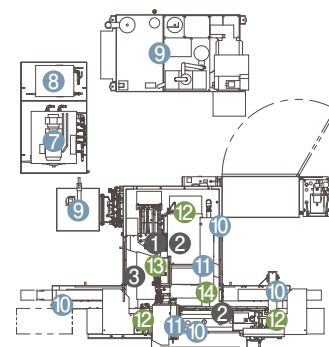
High-accuracy support package A

- ⑦ Wheel spindle bearing oil pump unit (separate installment)
- ⑧ Wheel spindle bearing oil cooler (separate installment)
- ⑨ Coolant supply unit (350 liter)
- ⑩ Bed/table washing
- ⑪ Cooling of wheelhead and workhead coolant



High-accuracy support package B

- ⑫ Servomotor cooling
- ⑬ Wheelhead linear scale
- ⑭ Thermal displacement correction sensor*
* Only P (straight type)

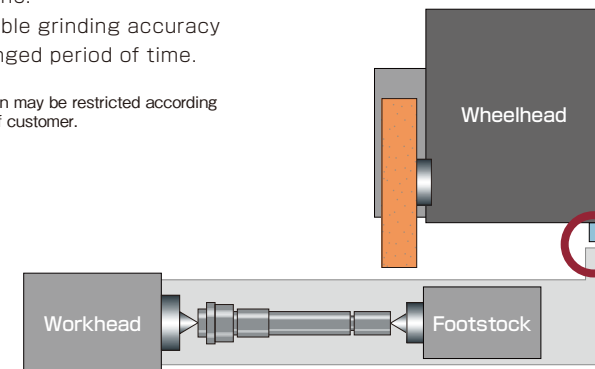


Thermal displacement correction sensor * Only P (straight type)

Option

A contact-type sensor compensates for thermal displacement due to the day-to-day variance in machine temperature. This reduces the warm-up time of the machine.
Maintain stable grinding accuracy over a prolonged period of time.

* The specification may be restricted according to the tooling of customer.

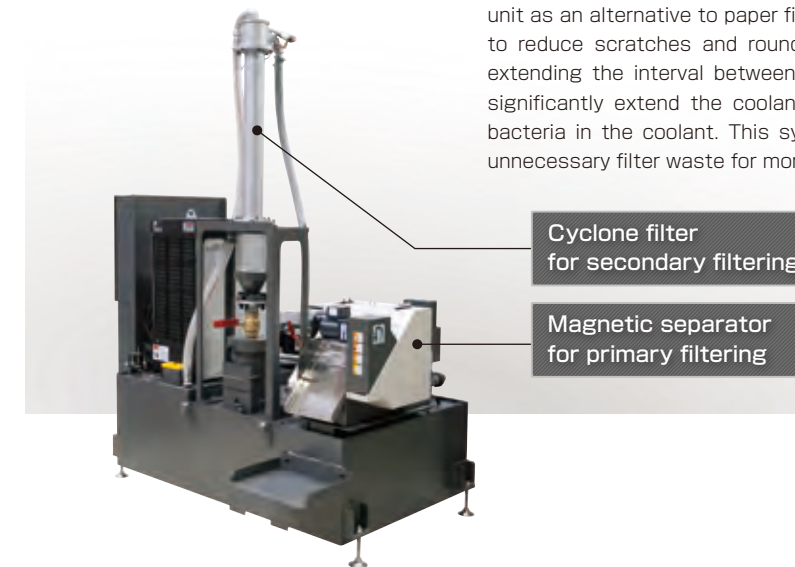


High cleanliness type coolant supply unit

Option

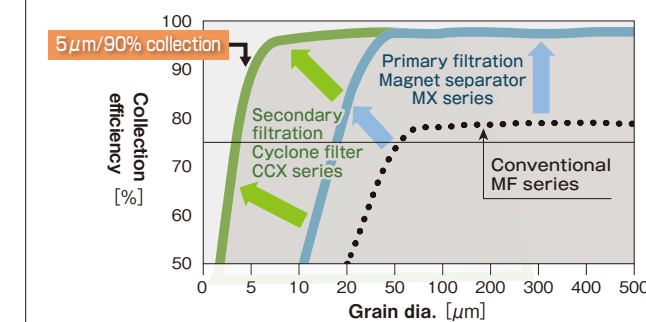
We have developed our own groundbreaking, high-cleanliness type coolant supply unit as an alternative to paper filters. Achieving a cleanliness of 5 ppm*, it is possible to reduce scratches and roundness defects, as well as reduce running costs by extending the interval between dressings. Furthermore, it has become possible to significantly extend the coolant replenishment cycle by minimizing the amount of bacteria in the coolant. This system adopts the cyclone method, which eliminates unnecessary filter waste for more environmentally friendly machining.

5 ppm: Equivalent to 5 mg in 1 liter of coolant fluid.



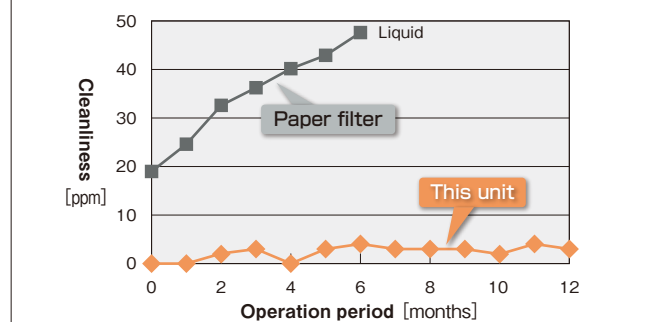
High filtering performance of 5ppm

Reliable collection of minute chips.



Stable filtering accuracy

Cleanliness is improved and stable at around 5ppm.



Simple and easy operation

A CNC grinding machine developed to operate with ease, even for individual workpieces. Grinding has been made quick and simple even without the proficiency and skill normally required for grinding.

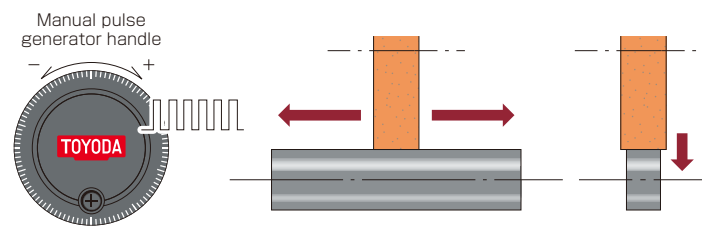


Displaying craftsmen skill-that is manual intervention

1 MPG (Manual Pulse Generator) intervention during automatic operation

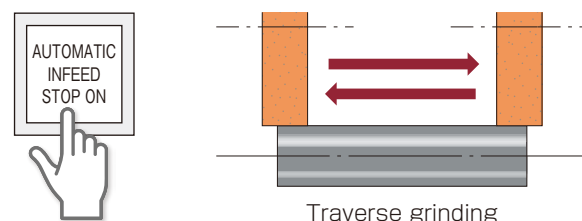
MPG operations are possible even during automatic operation, giving the feel of a manual machine. For example, by feeding the wheelhead using a handle, the time until contact is made with the workpiece is shortened. (Less dry feed time upon traverse grinding)

A safety function has been adopted for MPG operations. Please see "Safety handle infeed (P. 13)



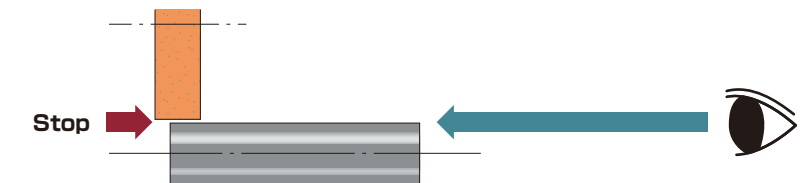
2 Automatic infeed stop

Even during the automatic cycle, it is possible to stop infeed. During traverse grinding, a speak-out (zero infeed) is quickly set without interruption of the traverse motion. For example, if spark out traverse has begun and the automatic infeed stop button is pressed, the traverse operation is continuously repeated. If the button is pressed again after the workpiece has been completed, the wheelhead will retreat and grinding will end.



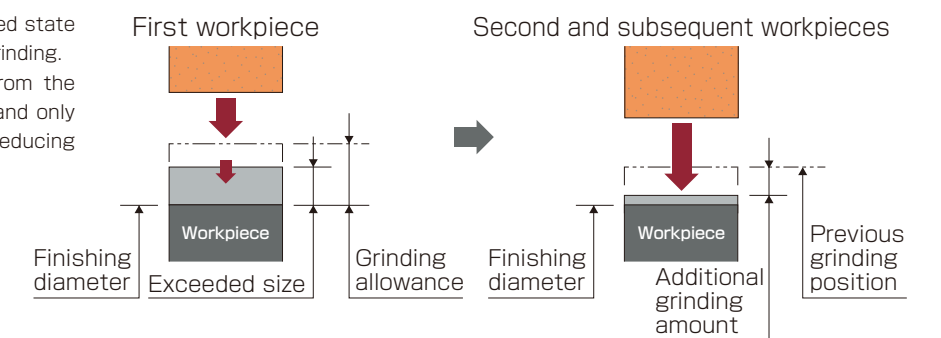
3 Stop before grinding

The machine can be stopped automatically before rough or finish grinding. When grinding workpieces on several machines, if the machine is stopped before finish grinding is performed, it is possible to check the workpiece before grinding, thus providing peace of mind.



4 Additional grinding

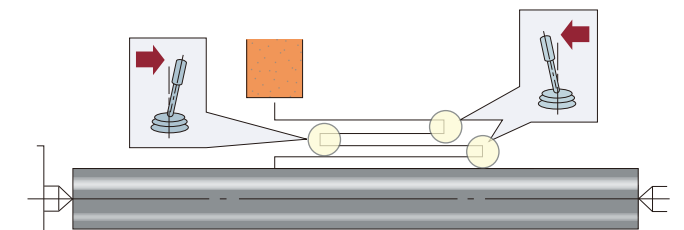
By grinding the workpiece to an oversized state in advance, it is possible to avoid overgrinding. For additional grinding, the position from the previous grinding is rapidly recovered and only the additional portion is ground, thus reducing dry feed time.



5 Manual table reversing (traverse grinding)

During automatic cycle of traverse grinding, the table can be changed from right advance to left advance by operating the lever. This reduces the dry feed time until contact with the workpiece is made.

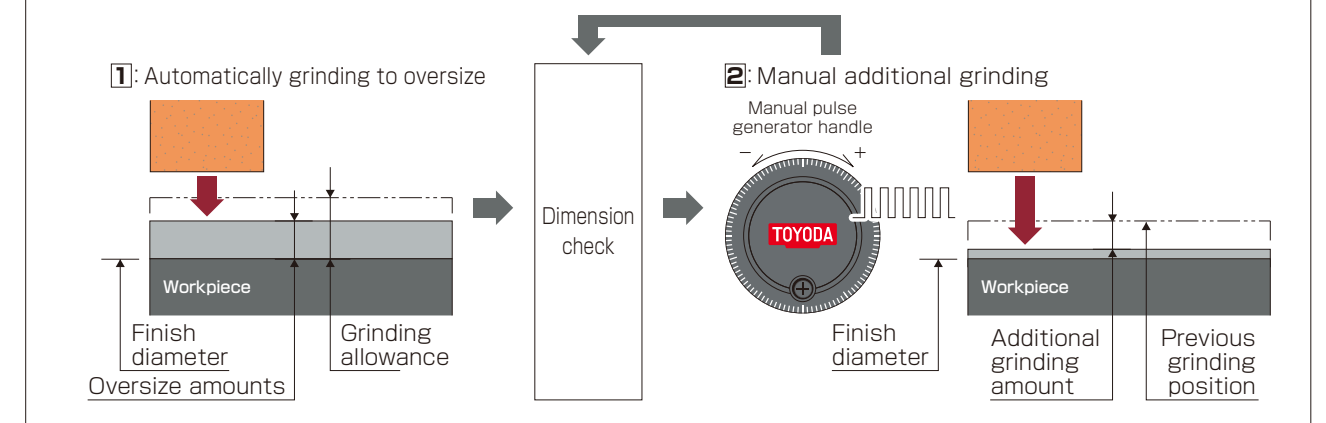
If the operator presses the automatic infeed stop button (page 9, item 2), he can move a lever to traverse to an arbitrary position so that grinding is concentrated on the remaining stock.



Various combinations of manual grinding are possible.

Example: Grinding the remaining stock manually, manual dimension inspection before final finish grinding

4 + 1 Additional grinding + MPG intervention during automatic operation

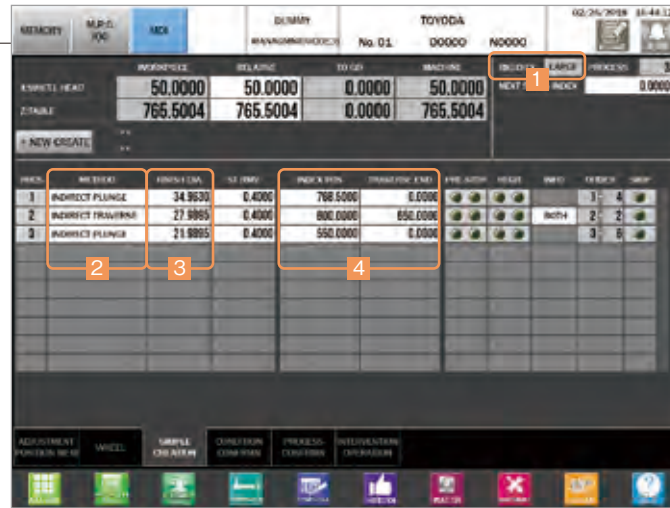


Simple and easy operation

We offer trouble-free operations to customers new to grinding or customers who have switched from hydraulic type general-purpose machines but wish to improve production efficiency by ensuring that accuracy is still easily achieved and the machine is still easy to use.

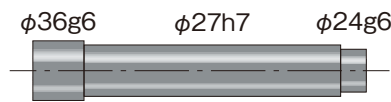
Improved efficiency of single part grinding

- No time-consuming set ups. The grinding conditions are automatically determined with minimal data input. The CNC can automatically determine grinding conditions that utilize the know-how of JTEKT's grinding specialists.
- Up to 10 steps can be entered at a time on one screen. Achieving simple and easy operation with a basic configuration.



- Programming is completed while the first workpiece is ground. The second and subsequent workpieces can be ground automatically.

- To grind the following workpiece.



Includes these features:

- Automatic judgment of workpiece rigidity**
Automatic judgment of rigidity by entering workpiece length and diameter*

* Average diameter

- Select the workpiece rigidity.**
1: Very rigid
2: Moderately rigid
3: Less rigid
- Select the grinding method.**
Plunge / Traverse
Plunge / traverse / Right face (optional)*
- Enter the finishing diameter.**
φ27h7
The grinding condition is decided automatically by operations 1, 2 and 3.
- Enter the table position.**
75, 220
Simplified data entry with position memory button
- Press the start button to start automatic grinding.**
(1 process only)

To the next grinding steps

* This is a right-face grinding cycle (optional) for the plain-head type. For the angular-head type, there is a shoulder grinding cycle. Please refer to "Grinding Cycle" (P. 21).

- Automatic grinding is possible from the first workpiece with no need of mastering.

- Grind the green face of the workpiece by turning the handle.**
Finishing diameter, Stock removal
- Measure the workpiece and set the additional stock removal.**
- Start the grinding cycle. The workpiece is automatically ground to the amount just set.**
START, Finishing diameter, Additional grinding amount, Stock removal

Drawing marks can be directly entered as they are!

- Fitting marks and dimensional tolerances frequently used in drawing can be entered directly. Entry is completed in a short time without referring to conversion tables or use of a calculator. (Extended data entry function)

Fitting mark input

Drawing indication: **Input screen:** SETTING VALUE 27h7

Dimensional tolerance input: **Drawing indication:** φ27^{-0.010}/_{-0.015} **Input screen:** REFERENCE VAL 27.0000, UPPER LOWER -0.0100 -0.0150

NC program: Automatic grinding is performed by targeting the median of the tolerance.

Dimensional tolerance input

Easy longitudinal sizing with displayed coordinate values

- Manual infeed can be performed by referring to the displayed relative coordinate value which can be reset at any position.

(Drawing indication) 180±0.01

Z:TABLE RELATIVE 0.0000 → Z:TABLE RELATIVE 180.0000

RESET

- A relative coordinate value of the table position from where reset is made, is displayed on the screen.

Iconized operation buttons

- Operations can be easily recognized through iconized operation buttons.



Please refer to TOYOPUC-Touch (P. 17, P. 18) for details.

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.

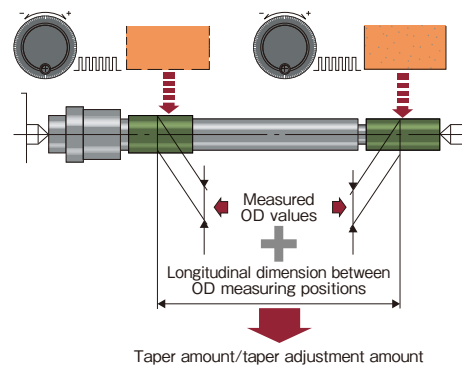


Simple and easy operation

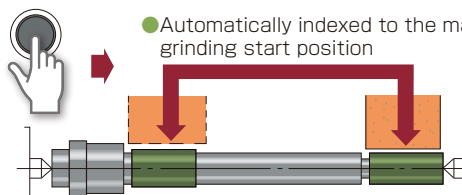
In pursuit of 'user-friendliness'

Easy taper adjustment

By entering measured values, the taper adjustment amount is displayed on the screen.

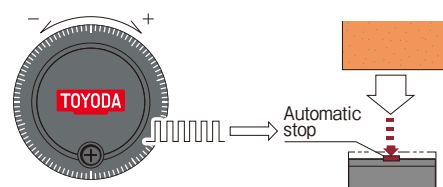


As automatic indexing is performed for the second and subsequent workpieces, no MGP interruption is required.



Safety handle infeed

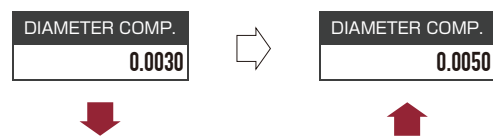
In the case of MPG infeed, the wheelhead automatically stops if fed to a prior set position. The machine can be operated safely even if by a beginner. (software positive stop function)



Easy size compensation

Entry by pressing a single button avoids grinding data entry mistakes. (Extended entry function)

To make the finishing diameter greater by 2μm:



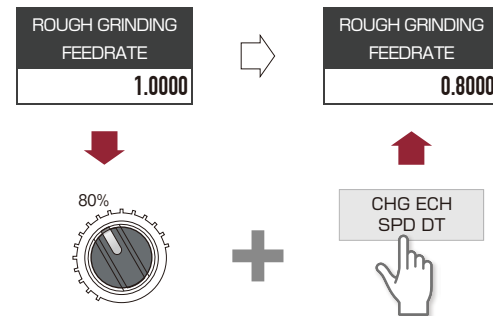
Move the cursor to the data you want to modify and press:



Straight forward data entry without calculations

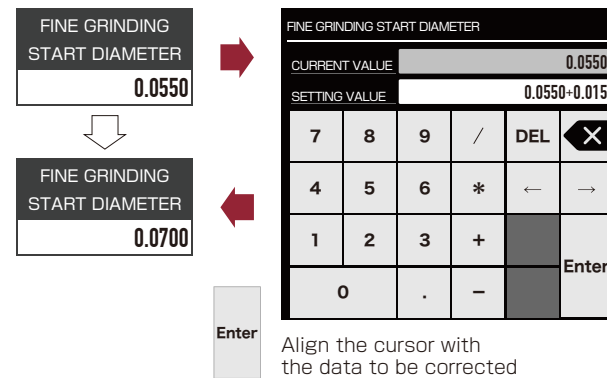
Speed data can be entered the way the operator desires, using the override selector switch. (Speed data proportional compensation function)

To reduce the rough grinding speed slightly:

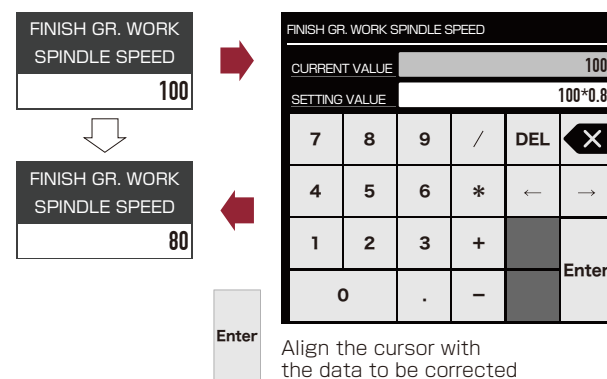


Addition, subtraction, multiplication and division are possible during data entry / modification without requiring a calculator. (Extended entry function)

To make the fine grinding start position greater by φ0.015mm:



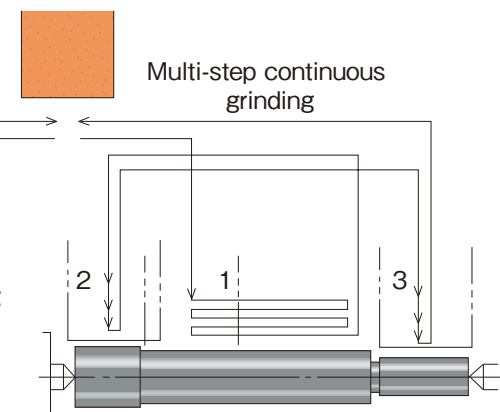
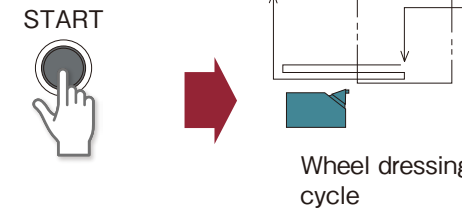
To reduce the fine grinding workpiece speed slightly:



More efficient multi-step continuous grinding

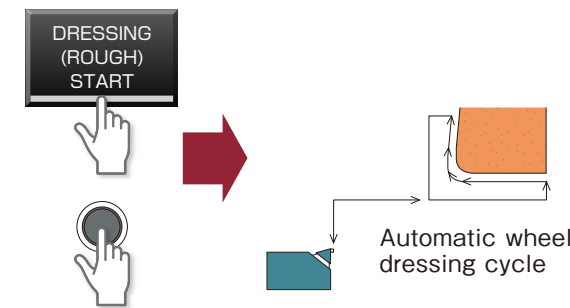
Automatic operation, from multi-step continuous grinding to wheel dressing, is performed by only pressing the start button.

Up to 64 kinds of grinding data can be stored.



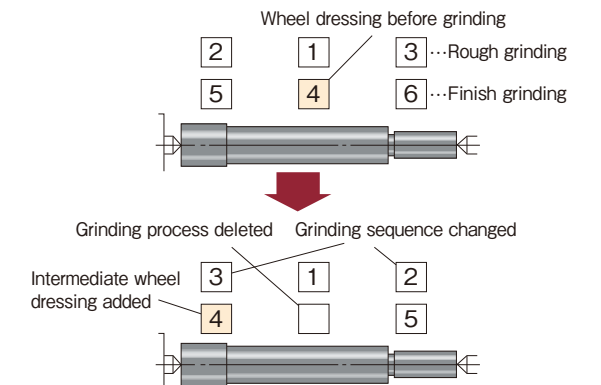
Wheel dressing performed by simplified operation

No set-up operations, such as diamond holder mounting/removal, wheelhead/table positioning, or table speed adjustment-required.



Flexibility for process changes

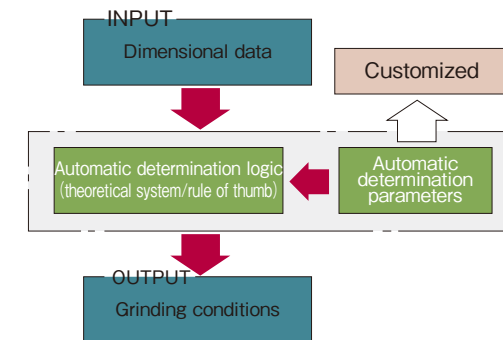
Changes such as grinding sequence adding/deleting intermediate wheel dressing are simple and easy.



Operator's experience reflected in the automatic determination system

Parameters for automatic determination can be modified based on the operator's know-how.

Simplified automatic determination system



Data batch backup function

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

Consideration of safety, reassurance and workability

A combination of CNC grinding with the machine front-face handle and optional manual grinding for skilled operators. Full-cover specifications have achieved safety and environmental friendliness, as well as improved set-up changeover efficiency. Placing priority on user friendliness, this machine is particularly designed for workability.

The photo includes a machine front-face handle and full cover. The design can be changed.



Excellent workability with a full cover Option

The full-enclosure option prevents the scattering of grinding mist, which ensures a safer manufacturing environment. Despite the machine being fully covered, the lighting and ability to gain proximity to the workpiece make setup changeover work easy.

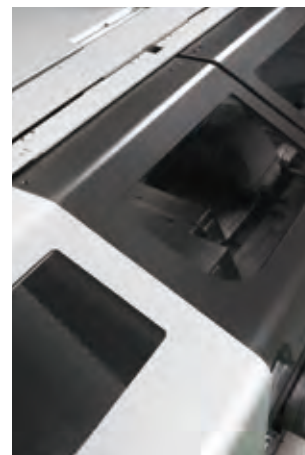
A wide opening for increased workability

The door on the front of the machine has been made larger to allow for better proximity to the workpiece, making it possible to work with improved posture. By allowing the top of the machine to open, crane operation is safer when loading or unloading large workpieces.



Machine front window with excellent visibility

Provides a window achieving visualization of work inside the machine.



Simplification of wheel replacement

The wheel is more accessible, which allows the operator to replace the wheel more easily and without any unnecessary strain.



Sensation operations with a machine front face handle Option

In response to our customers' need to perform rough grinding in an automatic cycle, but final finish grinding using manual operation, we have adopted a handle. This capability combines the best of a CNC machine and manual machine.

A handle for intuitive machining

This design adopts a cast iron spoke handle, which recreates the feeling of a manual machine.



Machine front with easy accessibility

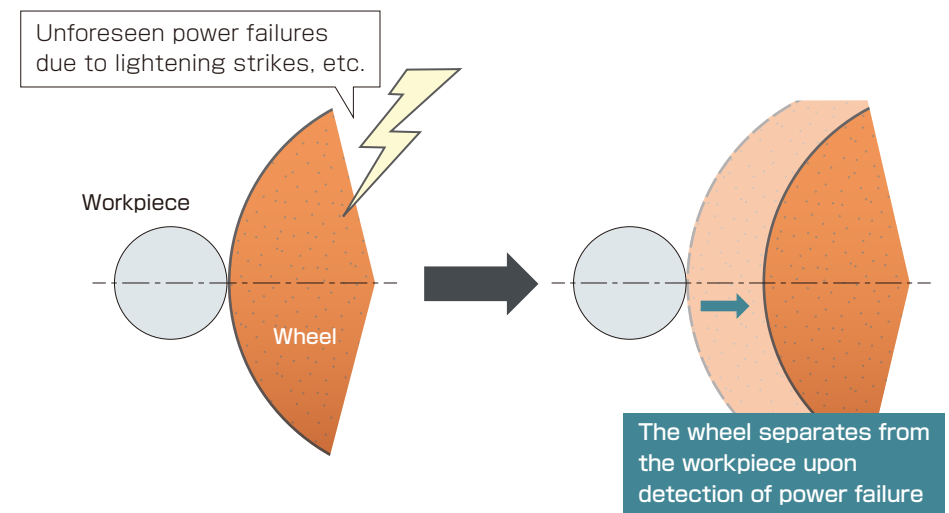
The workpiece is within close proximity to the operator, making setup changeover work easier.



Safety support functions

Ensuring safety during power failures

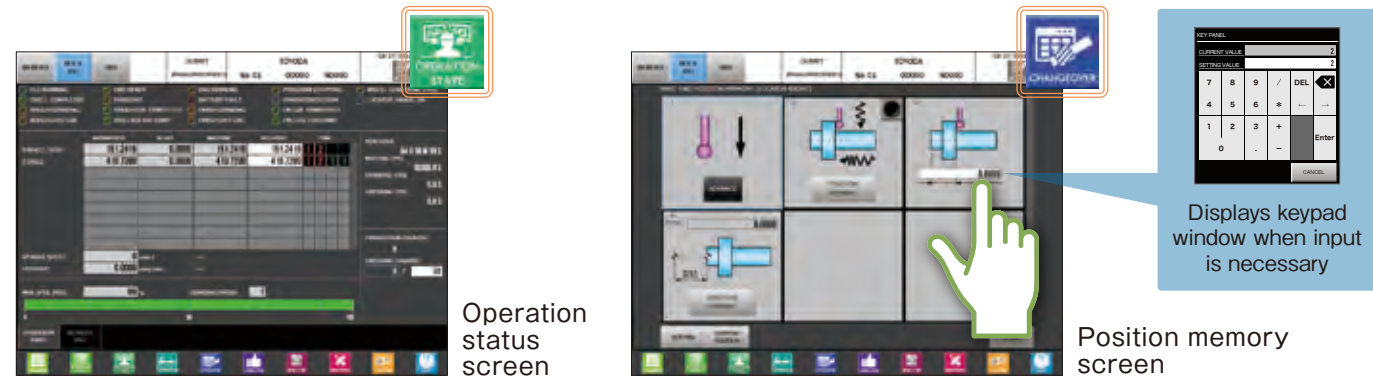
A standard machine feature retracts the wheel from the workpiece upon detection of power failure to prevent damage of the wheel and workpiece.



* Separation distance: $\phi 1\text{mm}$

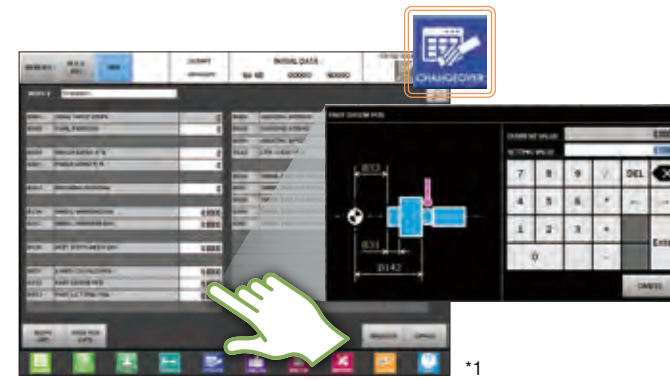
Visible and effective operation thanks to batch data display

A 25% larger display has made it possible to concentrate information on one screen and display the required key panel when necessary



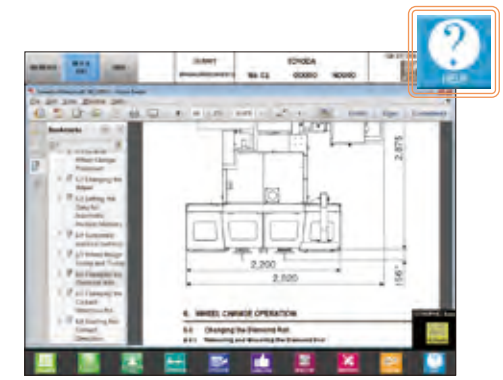
Assists work during setting of workpiece data

Workpiece data can be edited with an instruction display



Manual display on the operation panel

The manual can be read on the operation screen and a key word search function makes it possible to extract the target information



HMI in the loE era - Simple, safe and connectable -

TOYOPUC-Touch



Minimized frequency of screen calling operations

Iconized menu enables screen calling from any screen in a maximum of two operations



Realization of simple operation

Screen swiping and pinching in/out mimics the operability of a smart phone, making the TOYOPUC-Touch easy to use and easy to learn



Visualization of equipment status

Supports operations performed at customer work sites with functions that visualize equipment status

Visualization of inspection - Periodic inspection function -



Clarifies inspection timing and supports accurate inspections

- Clarification of inspection timing
- Registration of completed past inspections / measurement results

Visualization of status - Equipment monitor -



Supports production improvement with graphs showing previous operation and machining results

- ON/OFF status of devices can be viewed without having to check devices directly
- Internal ladder circuits can also be viewed easily

Visualization of energy - Energy monitoring - Option



Supports energy saving activities by visualizing energy usage

- Current energy usage can be compared with past energy usage of the selected period
- Effects of enabling/disabling energy saving settings can be viewed

Visualization of longevity - Longevity management function -



Supports scheduled maintenance with notification functions that tracks the life of a part.

- Notifies the user of inspections for parts that are close to the end of its lifecycle.
- Minimizes machine stop time through preventive inspection / part preparation

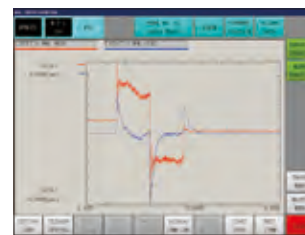
Visualization of performance - Operation monitor -



Supports production control and improvement via graphs showing past operation performance / machining performance

- Performance can be viewed easily on graphs and tables, and data entry is also possible
- Current performance can be compared with past performance of the selected period

Visualization of servo status - servo sampling function -



Enables equipment status to be confirmed and supports countermeasures

- Enables the recording and display of sampling data such as current, position deviation and speed
- A normal value comparison function helps the recovery and diagnosis of machine faults

Rapid support in remote operation Option

Accurate support reducing fault recovery time

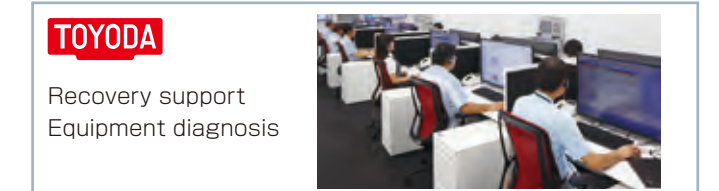


Support provided whenever required by the customer

Connects to equipment in real time

*1: Information on ID/Password

*2: Remote access



*1: A production machine-support screen is available as an option.

GE4Pi-PRO GE4Ai-PRO

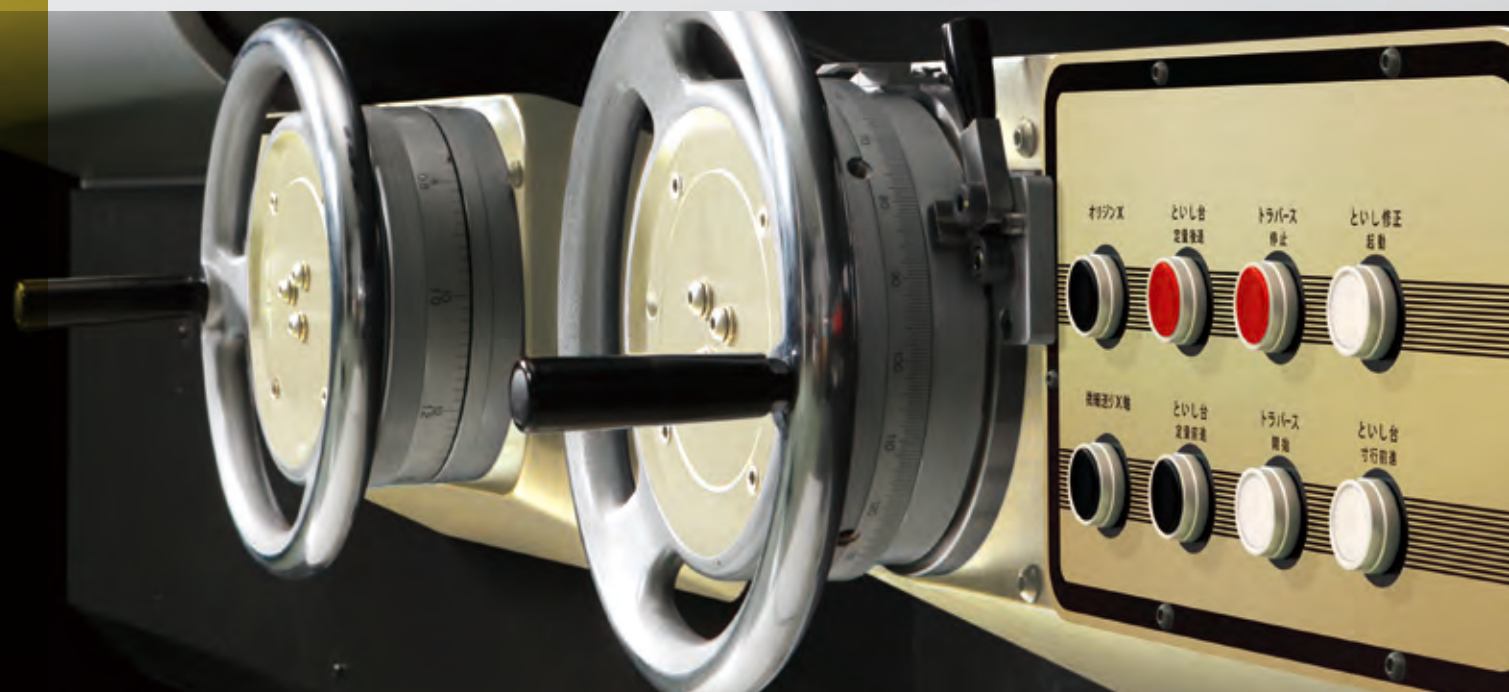
Specifications created by professionals,
utilizing expert craftsmanship

Pursuing ease of operation - Professional handle

- + Achieves hydraulic machine operability using an NC machine
- + Customizable front operation panel

Enables high grade "monozukuri" that can be achieved by any operator

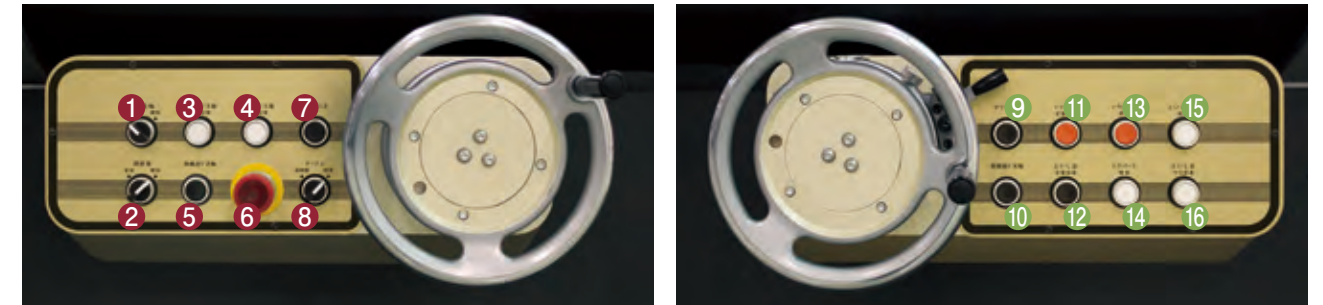
- + Improved efficiency for single-part grinding
- + Specialized screen display for handle operations



GE4i-PRO: Excellent operability

With handle operation that feels like a hydraulic machine, this grinder is optimal for high-accuracy machining of individual workpieces. A single GE3i-PRO enables skilled technicians to use the machine as though it were hydraulic, and allows those with less experience to use it as an NC-controlled machine. This enables intuitive operation, digitization of know-how, and the passing down of technical knowledge to be achieved through the machine.

Explanation of operation panel functions



No.	Name	Function
1	Work spindle "Enable/disable" setting switch	If "Enable", the work spindle rotates at wheelhead constant advance
2	Coolant "Enable/disable" setting switch	If "Enable", coolant is discharged from the coolant nozzle at wheelhead constant advance
3	Left traverse end position memory button	Sets the table travel zone and memorizes the left side reverse position
4	Right traverse end position memory button	Sets the table travel zone and memorizes the right side reverse position
5	Micro-feed (Z-axis) button	Table feed: 1 μm infeed per push
6	Emergency stop button	Stops the machine in an emergency
7	Origin Z button	Relative coordinate of Z-axis is reset to the value of the origin
8	Table "Standard/high-precision" setting switch	Selects handle magnification

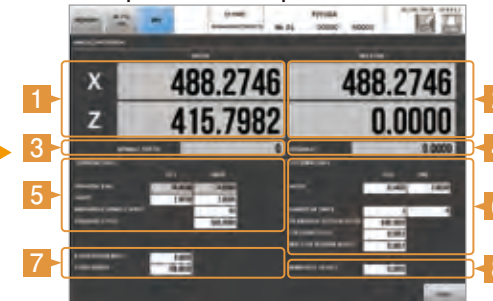
No.	Name	Function
9	Origin X button	Relative coordinate of X-axis is reset to the value of the origin
10	Micro-feed (X-axis) button	Wheelhead feed: φ2 μm infeed per push
11	Wheelhead constant retract button	Wheelhead retracts at 80 mm dia.
12	Wheelhead constant advance button	Wheelhead advances at 80 mm dia.
13	Traverse stop button	Stops table traverse motion
14	Traverse start button	Starts table traverse motion
15	Wheel dressing start button	The "CNC running" lamp lights up, and the rough wheel dressing cycle starts
16	Wheelhead jog advance button	The wheelhead advances while this button is being pressed

Manual operation screen

Specialized operation panel display screen for handle operations



Example of manual operation screen

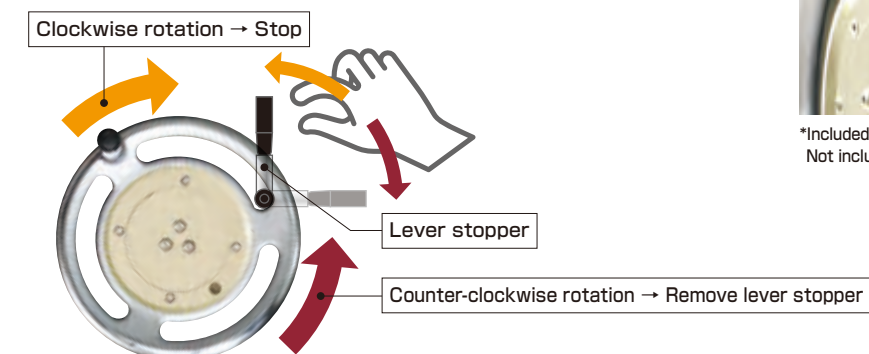


Example of screen display contents

No.	Screen display contents
1	Workpiece coordinate display
2	Relative coordinate display (can be reset via origin function)
3	Work spindle rotation display
4	Traverse feedrate display
5	Grinding condition settings (work spindle rotation and traverse machining conditions)
6	Wheel dressing condition settings
7	Relative coordinate reset value settings
8	Combination of workpiece dimensions and screen coordinates

Mechanical wheelhead positive stop function

The lever stopper is used during final dimension adjustment of wheelhead feed to enable simplified setting of the wheelhead advanced end position without changing the data settings of the grinding feed amount.



*Included for standard handle rotation direction (figure on bottom).
Not included for reverse handle rotation direction.



Grinding cycles (GE4i, GE4i-PRO)

Straight type

- 1. Plunge (indirect sizing)**
- 2. Traverse (indirect sizing)**
- 3. Plunge / traverse (indirect sizing)**
- 4. Right face Option**

Internal grinding cycle Option *GE4Pi only

- 1.Plunge**

(Item 1 above is used.)
- 2.Traverse**

(Item 2 above is used.)

Angular type

- 1. Plunge (indirect sizing)**
- 2. Traverse (indirect sizing)**
- 3. Plunge / traverse (indirect sizing)**
- 4.Shoulder**

Notes 1: The above grinding cycles can be divided into rough and finish grinding cycles by using the cycle dividing function.
 2: A special option has been provided to perform right-face grinding with the straight type in the automatic cycle. This requires a lateral locator. Manual grinding is performed using manual intervention operations or manual operator.
 3: Direct sizing plunge, direct sizing traverse or direct sizing plunge/traverse grinding cycles are optionally available.
 4: Only indirect sizing cycle is available (direct sizing cycle is not available) for the internal grinding cycle. * Only P (straight type)
 5: Displayed coordinates for internal grinding do not correspond with the workpiece. * Only P (straight type)
 6: Internal multi-step grinding can be performed manually. * Only P (straight type)

Wheel dressing cycles (GE4i, GE4i-PRO)

Straight type

Straight

Left radius and recess

Profile dressing Option (Max.15points)

Angular type

Radius wheel

Profile dressing Option (Max.15points)

Notes 1: Up to 5 patterns of wheel shape can be registered.
 2: 3 wheel dressing conditions; "rough", "semi-finish" and "finish" can be set.
 3: The automatic dressing function for internal grinding wheels is not provided. Dress them manually using an internal/external diamond tool holder to be mounted on the table.

TOYOPUC-GC70

●: Standard □: Option

Item	No.	Specifications	Accessories
Controlled axes	1	X-axis (wheelhead feed)	●
	2	Z-axis (table feed)	●
HMI	3	TOYOPUC-Touch	●
CRT display	4	15 inch TFT color	●
File management	5	Structured data management (Production, grinding and maintenance)	●
	6	Grinding data patterns: Max. 64 (30processes/pattern, Max. 1,920 processes)	●
Coordinate setting	7	Position memory (various)	●
	8	Relative coordinates	●
Compensation function	9	Size compensation	●
Display	10	Operation monitor display	●
	11	Manual switch and lamp display	●
	12	Operation procedure display	●
	13	Display of items for inspection and maintenance	●
	14	Metric display	●
Operation	15	Inch display	□
	16	Canned cycle	●
Manual intervention operation	17	Test cycle	●
	18	Wheel dressing cycle	●
	19	Return cycle	●
	20	Single block	●
	21	Grinding step skip	●
	22	Rapid feed override 0, 10, 50, 100%	●
	23	Grinding feed override (X-axis) 0-150%, in units of 10%	●
	24	Grinding feed override (Z-axis) 0-150%, in units of 10%	●
	25	Work spindle override 50~200%, in units of 10%	●
	26	MPG intervention during auto operation	●
Auto-sizer	27	Taper corrector	●
	28	Cycle division function	●
	29	Cycle interruption and manual size compensation	●
	30	Cycle interruption and infeed function	●
	31	Software positive stop function	●
Programming function	32	Manual table reverse turning function	●
	33	Auto-sizer manual additional grinding function	□
	34	Auto-sizer control unit	□
Maintenance	35	Simplified automatic determination *	●
	36	Speed data proportional compensation function	●
	37	Extended data entry function	●
	38	Operation entry function	●
	39	Process editing function	●
Counter	40	Wheel change prediction display	●
	41	Min. wheel dia. display	●
	42	Self diagnosis	●
	43	Alarm history display	●
	44	Batch backup function	●
Cycle time display	45	Servo sampling function	●
	46	Production counter	●
Others	47	Wheel dressing interval counter	●
	48	Machine operation hours	●
	49	Processing cycle time	●
Others	50	Grinding cycle time	●
	51	Wheel dressing time	●
	52	USB memory I/F	●
Others	53	Wheel return at power failure	●

*GE4Pi and GE4Pi-PRO's optional internal grinding device cannot be included.

Description of main functions

7	Position memory	The wheel dia., diamond tool position, and longitudinal workpiece position can be stored by one touch of a button.
26	MPG intervention during auto operation	M.P.G. operation is valid during automatic operation.
27	Taper corrector	By entering values measured at 2 points after manual grinding, the taper compensation amount is displayed on CRT. Automatic indexing to the grinding start position is performed for the second and subsequent workpieces.
28	Cycle division function	A workpiece is automatically ground by dividing the grinding cycle into rough and finish grinding cycles.
29	Cycle interruption and manual size compensation	Automatic operation is suspended to allow table position compensation and manual shoulder grinding.
30	Cycle interruption and infeed function	Automatic operation is suspended to allow finishing dia. compensation by entering the additional infeed amount obtained through comparison with the measured grinding dia.
31	Software positive stop function	The wheelhead and table automatically stopped at the preset positions when fed using the M.P.G.
33	Auto-sizer manual additional grinding function	Manual infeed can be performed while referring to the values output from the auto-sizer amplifier.
36	Speed data proportional compensation function	The infeed speed and traverse speed can be changed using the override selector switch.
37	Extended data entry function	Drawing mark entry, additional taper grinding amount calculation, addition/subtraction/division/multiplication, and entry by one touch of a button are possible.
38	Operation entry function	The wheelhead and table positioning data can be entered by pressing buttons.
39	Grinding cycle editing function	The grinding sequence can be changed and intermediate wheel dressing can be added/deleted with an easy operation.

Machine layout (GE4i, GE4i-PRO)

Standard cover (open top)

Full cover **Option**

Standard periphery unit specifications Unit: mm

Cover type	Standard cover (open top)		Full cover Option
	Table end cover	Reduced-machine width specifications	Reduced-machine width specifications
Distance between centers	Fixed type	Bellows type op	Bellows type op
	A: Width	B: Width	C: Width
500	3,600	3,210	3,570
1,000	4,600	4,250	4,580
1,500	6,130	5,450	5,860
2,000	7,700	6,700	7,150

Standard cover (open top) + Periphery unit **Option**

Full cover + Periphery unit **Option**

High cleanliness type coolant supply unit
Wheel spindle bearing oil pump unit (separate installment)
Wheel spindle bearing oil cooler (separate installment)
Coolant collection tank

Full options **Option** Unit: mm

Cover type	Standard cover (open top)		Full cover Option
	Table end cover	Reduced-machine width specifications	Reduced-machine width specifications
Distance between centers	Fixed type	Bellows type op	Bellows type op
	A: Width	B: Width	C: Width
500	3,670	3,540	3,570
1,000	4,600	4,250	4,580
1,500	6,130	5,450	5,860
2,000	7,700	6,700	7,150

Machine height Unit: mm

Cover type	Height of cover top face	Max. machine height
Standard cover (open top)	—	1,795*
Manual open/close type front cover op	1,280	1,795*
Full cover specification op	1,495	1,795*
Special full cover specification (when equipped with 510 mm diameter wheel, internal grinding device, φ400 mm over-table swing and lateral positioning device (P: mounted on wheel guard)) op	1,830	1,830

* Height of operation panel top face

This is the layout drawing for GE4Pi-PRO specifications.
*Dimensions of GE4Pi-PRO with front operation handle included.

op is special specifications

List of accessories (GE4i, GE4i-PRO)

(When an optional A accessory is chosen, the corresponding standard one is not supplied.)
●: Standard accessory ○: Optional A accessory □: Optional B accessory

Category	No.	Unit name	Remarks	GE4i	GE4i-PRO
Table	1	Table swivel unit		●	●
	2	Table swivel angle sensor Digital display	*1, 2	□	□
	3	Table end cover (fixed type)		●	●
	4	Table end cover (bellows type)	Reduced machine width specification	○	○
	5	Table front Fixed cover		●	●
	6	Insert type Front cover		□	□
	7	Manual open and close Front cover	No confirmation device, no windows	○	○
	8	Manual open and close operation type Front cover Door close confirmation unit		○	○
	9	Swing on table φ400 mm support		□	□
Workhead	10	Dead spindle workhead with infinitely variable speed		●	●
	11	Live/dead spindle workhead (infinitely variable speed, swiveling)	*3	○	○
	12	Carbide-tipped center (MT No.4)		●	●
	13	Spindle in-position stop unit (proximity type switch)		□	□
Footstock	14	Manual footstock	Manual lever type: 25mm stroke	●	●
	15	Manual footstock with manual taper adjustment	Manual lever type: 25mm stroke	○	○
	16	Manual footstock with manual center distance adjustment	Manual lever type: 25mm stroke Center distance adjustment: 160mm	○	○
	17	Manual footstock with manual taper adjustment & manual center distance adjustment	Manual lever type: 25mm stroke Center distance adjustment: 160mm	○	○
	18	Hydraulic footstock (pedal-start type)	*4, 5 Hydraulic type: select either 20mm or 60mm stroke	○	○
	19	Hydraulic footstock with manual taper adjustment (pedal-start type)	*4, 5 Hydraulic type: 60mm stroke	○	○
	20	Hydraulic footstock with manual center distance adjustment (pedal-start type)	*4, 5 Hydraulic type: select either 20mm or 60mm stroke Center distance adjustment: 160mm	○	○
	21	Hydraulic footstock with manual taper adjustment & manual center distance adjustment (pedal-start type)	*4, 5 Hydraulic type: select either 20mm or 60mm stroke Center distance adjustment: 160mm	○	○
	22	Carbide-tipped center (MT No.4)		●	●
	23	Footstock weight air reduction unit	*6	□	□
Wheelhead	24	33m/s wheel surface speed one speed specification	3.7kW wheel spindle motor	●	●
	25	33m/s wheel surface speed two-speed specification	3.7kW wheel spindle motor	○	○
	26	45m/s wheel surface speed one speed specification	5.5kW wheel spindle motor	○	○
	27	45m/s wheel surface speed two-speed specification (excess surface speed prevention device)	5.5kW wheel spindle motor	○	○
	28	φ510mm specification response (max. wheel width: 50mm)	Only P (straight type) 33m/s wheel surface speed, 3.7kW wheel spindle motor	○	○
	29	φ510mm specification response (max. wheel width: 50mm)	Only P (straight type) 45m/s wheel surface speed, 5.5kW wheel spindle motor	○	○
	30	Wheel surface speed variable speed unit (inverter control [deceleration only], manual adjustment)	*Cannot be combined with 45m/s wheel surface speed two-speed spec.	□	□
	31	Standard wheel for 33m/s surface speed	Wheel width 75mm	●	●
	32	Special specification wheel	Select surface speed, wheel diameter and wheel width	□	□
	33	Standard wheel flange (round nut: 33~80mm in width)	1 set	●	●
	34	Thin wheel flange (round nut: 20~65mm in width)		□	□
	35	Wide wheel flange (round nut: 50~100mm in width)		□	□
	36	Wheel flange for φ510mm (round nut: 34-50mm width)	Only P (straight type)	□	□
	37	Responding to wide wheels (wheel width: up to max of 100mm)	Not possible with φ510mm specification	○	○
	38	Wheel spindle overload detection		□	□

*1: 100V power required. *2: Please contact us when you wish to select 2,000mm distance between centers.
*3: Workhead position change is necessary when operating the machine by swiveling the workhead, as the workhead interferes with the wheel dresser mounted on the traverse table.
*4: No confirmation unit. *5: Hydraulic oil pump unit required. *6: Pneumatic unit is required. It is unnecessary when linear scale pneumatic unit is attached.

List of accessories (GE4i, GE4i-PRO)

(When an optional A accessory is chosen, the corresponding standard one is not supplied.)

●: Standard accessory ○: Optional A accessory □: Optional B accessory

Category	No.	Unit name	Remarks	GE4i	GE4i-PRO
Pump unit	39	Lubricant pump unit (12L)	No confirmation device for no oil	●	●
	40	Hydraulic oil pump unit (10L)	No confirmation device for no oil	□	□
Coolant supply unit	41	Coolant supply unit (150L)	No washing pump	●	●
	42	Coolant supply unit (230L)	No washing pump	○	○
	43	Coolant supply unit with paper filter (48L collection tank, 300L tank, 40L/min processing capacity)	Without washing pump With sub tank for pumping	○	○
	44	Coolant supply unit with paper filter (48L collection tank, 350L tank, 80L/min processing capacity)	Without washing pump With sub tank for pumping	○	○
	45	Coolant supply unit (48L collection tank, 350L tank, select either 40L/min or 80L/min processing capacity (ferrite type))	With pump, with coolant cooling function With sub tank for pumping	○	○
	46	Coolant supply unit (48L collection tank, 350L tank, select either 40L/min or 80L/min processing capacity (rare earth type))	With pump, with coolant cooling function With sub tank for pumping	○	○
	47	High cleanliness type coolant supply unit K100 (48L collection tank, 190L primary tank, 260L secondary tank, magnet separator with 120L/min processing capacity)	With pump, with coolant cooling function With sub tank for pumping	○	○
	48	Magnetic separator ferrite type (select either 40L/min or 80L/min processing capacity)	*7	□	□
	49	Magnetic separator rare earth type (select either 40L/min or 80L/min processing capacity)	*7	□	□
	50	Coolant lower limit confirmation device		□	□
	51	Base, table washing	*7 Washing pump required	□	□
	52	Auto-sizer cooling	Washing pump required	□	□
Wheel dresser	53	Standard wheel dresser (traverse table mounted on workhead rear section)		●	●
	54	Angular wheel dresser (swivel table-mounted)		□	□
	55	Radius truing device (swivel table-mounted)		□	□
	56	Diamond holder for internal / external grinding (swivel table-mounted)		□	□
	57	Formed diamond tool (shank diameter: 8mm)		□	□
	58	Single-point diamond tool (shank diameter: 8mm)	Only P (straight type)	□	□
Tool	59	Tools (special-purpose tools)		●	●
	60	Tools (wrench / spanner)		□	□
	61	Wheel lifting hook		□	□
	62	Wheel balancing arbor / Wheel balancing stand	Special-purpose wheel balance stand specific to wheel diameter is required	□	□
	63	Jib crane for wheel changes (for 100kg)		□	□
Steady rest	64	Manual steady rest (φ10~φ100mm, φ100~φ200mm)		□	□
	65	3-point manual steady rest (φ10~φ100mm, φ100~φ200mm)		□	□
Driving dog	66	Driving dog (φ5~φ50mm, φ50~φ80mm, φ80mm~φ190mm)		□	□
	67	Automatic dog (φ5~φ45mm, φ45~φ80mm)		□	□
Chuck	68	3-jaw scroll chuc (4", 5", 6", 7", 9" available)	*8, 9	□	□
	69	Independent 4-jaw chuck (4", 6", 8", 10" available)	*8, 9	□	□
	70	4-slot face plate (φ228mm)	*8	□	□
Work holder	71	Workpiece holder (one each for R and L φ10~φ120mm)		□	□
Auto sizer	72	Auto-sizer for OD (3P, φ5~φ80mm)	*5 JTEKT-made, CNC built-in amplifier	□	□
	73	Auto-sizer for OD (3P, φ5~φ80mm) 2 auto sizers	*5 JTEKT-made, CNC built-in amplifier	□	□
	74	Auto sizer for large dia. cylindrical workpieces (3P, φ10 to φ160mm) Right offset/left offset	*5 JTEKT-made, CNC built-in amplifier	□	□
	75	Spline auto-sizer for OD (3P, with retract, φ5~φ80mm)	*6 JTEKT-made, CNC built-in amplifier	□	□
Lateral locator	76	Automatic lateral locator P: Mounted on the wheel guard/A: Mounted on the wheelhead	*5	□	□
Pneumatic-related	77	Pneumatic unit		□	□

*1: 100V power required. *2: Please contact us when you wish to select 2,000mm distance between centers.
 *3: Workhead position change is necessary when operating the machine by swiveling the workhead, as the workhead interferes with the wheel dresser mounted on the traverse table.
 *4: No confirmation unit. *5: Hydraulic oil pump unit required. *6: Pneumatic unit is required. It is unnecessary when linear scale pneumatic unit is attached.
 *7: Processing capability of approximately 1L/m for every 1mm of wheel width. Select a magnetic separator appropriate to the wheel width and coolant washing level. Also, select the 80L/min specification if base and table washing is to be carried out.

Category	No.	Unit name	Remarks	GE4i	GE4i-PRO
Mist collector	78	Mist collector 1 set		□	□
CBN supported	79	CBN wheel specifications	Only P (straight type)	□	□
	80	Manual pulse generator (mounted on operation panel)		●	●
Control unit	81	Table direction selection lever		●	●
	82	Workhead spindle ON-OFF / inching switch		●	●
	83	One USB flash drive for TOYOPUC-GC70 (JTEKT-made, backup data entered)		●	●
	84	USB flash drive for TOYOPUC-GC70 (JTEKT-made)		□	□
	85	100V power		□	□
	86	100V outlet (mounted inside of control box)	*1	□	□
	87	Machine front-face handle specifications	Pulse generator	□	×
	88	Machine front-face handle specifications Professional handle spec.	Pulse generator	×	●
	89	Signal tower - 3 color specification		□	□
	90	Electrical leak breaker		□	□
	91	Cabinet interior lighting		□	□
	92	Automatic power isolation		□	□
	93	Manual door close confirmation unit enable / disable switch	Manual door close confirmation unit is required	□	□
	94	Lighting unit (LED / fluorescent type)		□	□
	95	Lighting unit (LED / spotlight type)		□	□
Overseas supported	96	Multilanguage support	Please consult with us regarding available languages.	□	□
	97	Supporting different voltage		□	□
Machine color	98	JTEKT standard paint color (silver metallic, dark gray metallic, dark gray)		●	●
	99	Specified color other than JTEKT's standard specified color Machine body only 1 color		○	○
Customer's run off test	100	JTEKT's standard TP grinding		□	□
Instruction manual	101	Machine specifications, operation manual, maintenance manual, electric control drawings - 1 copy each (CD)	Submitted in CD form	●	●
	102	Machine specifications, operation manual, maintenance manual, electric control drawings - 1 copy each (bound)	Will bind and deliver	□	□
Internal grinding unit	103	The internal grinding device can only be included with the P (straight type). For details, please refer to the separate sheet regarding the internal grinding attachment.	Only P (straight type)	□	□
Special cycles	104	Profile dressing (15 point)	Please refer to the cycle pattern. P. 21	□	□
	105	Right-face cycle	Lateral locator is required Only P (straight type)	□	□
Full cover	106	Full-cover specifications	*10 Manual open / close type	○	○
	107	Door close confirmation unit	*10 Manual open / close type	○	○
High-accuracy support	108	Wheelhead linear scale	*11 Linear scale pneumatic unit is required	○	○
	109	Table linear scale	Linear scale pneumatic unit is required	○	○
	110	Linear scale pneumatic unit		□	□
	111	Thermal displacement correction sensor Distance sensor between wheelhead and table	*6 Only P (straight type)	○	○
	112	Wheel spindle bearing oil fan cooler		●	●
	113	Wheel spindle bearing oil cooler		□	□
	114	Wheel spindle bearing oil pump unit (separate installment) + wheel spindle bearing oil cooler (separate installment)		□	□
	115	Wheel spindle bearing oil pump unit (separate installment) + wheel spindle bearing oil cooler (separate installment) + servo motor cooler		□	□
	116	Wheelhead / workhead coolant cooler (cooling with coolant)	Coolant supply unit with coolant cooling is required	○	○

*8: Live/dead spindle workhead is necessary.
 *9: Depending on wheel shape, there is a possibility that the wheel may interfere with the chuck cover during wheel dressing. Check before performing wheel dressing.
 *10: Please contact us if you wish to mount φ400 mm over-table swing, φ510 mm wheel, the installation of an internal grinding unit and lateral locator (P: mounted on the wheel guard).
 *11: Please contact us if you wish to mount a φ510 mm wheel.

OPTION (GE4i, GE4i-PRO)



Belt drive-type internal grinding device *Only GE4Pi or GE4Pi-PRO **Option**

For those customers who perform internal grinding, we have prepared a hinge-type ascending/descending type device that can be secured to the front of the wheelhead.



φ400mm over-table swing **Option**

For those customers wanting to grind workpieces with a large swing (e.g. large gear parts, etc.), we have prepared a machine with an increased swing of φ400mm



Depending on the shape of the workpiece and specifications of the machine, there may be cases where this amount of swing is not possible. Please confirm with our sales department.



Category	No.	Name
Workhead	1	Dead spindle workhead with infinitely variable speed
	2	Live / dead spindle workhead OP
Footstock	3	Manual footstock
	4	Manual footstock with manual center distance adjustment OP
	5	Manual footstock with manual taper adjustment & manual center distance adjustment OP
Wheel Dresser	6	Wheel dresser (traverse table mounted on workhead rear section)
	7	Wheel dresser for internal/external grinding OP
	8	Formed diamond tool OP
Wheel-related	9	Single-point diamond tool OP
	10	Wheel balancing arbor OP
Coolant supply unit	11	Wheel balancing stand OP
	12	Coolant supply unit (150L)
Magnetic separator	13	Coolant unit with magnetic separator and paper filter (300 L processing ability: 40 L/min) OP
	14	High cleanliness type coolant supply unit OP
	15	Magnetic separator (processing capacity 40L/min) OP

Category	No.	Name
Lateral locator	16	Auto-sizer for cylindrical OP
	17	Lateral locator (mounted on the wheel cover) OP
Driving dog	18	Driving dog (φ5~φ50mm, φ50~φ80mm, φ80~φ190mm) OP
	19	Automatic dog (φ5~φ45mm, φ45~φ80mm) OP
Chuck Center	20	3-jaw scroll chuck (4", 5", 6", 7", 9" available) OP
	21	Independent 4-jaw chuck (4", 6", 8", 10" available) OP
	22	Carbide-tipped center (MT No.4)
Other	23	Table end cover (bellows type) OP
	24	2-point manual steady rest (φ10~φ100mm, φ100~φ200mm) OP
	25	3-point manual steady rest (φ10~φ100mm, φ100~φ200mm) OP
	26	Workpiece temp. stand (one each R and L φ10~φ120mm) OP
	27	Lighting unit fluorescent lamp (LED) OP
	28	Wheel spindle bearing oil pump unit (separate installment) OP
	29	wheel spindle bearing oil cooler (separate installment) OP
	30	Manual open/close type front cover OP

OP is special specifications

Digital display of taper angle adjustment amount **Option**

A sensor has been installed on the swivel table to provide digital display and make it possible to detect the current position of swivel table tilt. This simplifies the setup changeover work due to taper angle difference.



This photo is for illustration purposes only.

Machine specifications (GE4i, GE4i-PRO)

Item		Unit	Specification	GE4Pi-50 GE4Ai-50 GE4Pi-50PRO GE4Ai-50PRO	GE4Pi-100 GE4Ai-100 GE4Pi-100PRO GE4Ai-100PRO	GE4Pi-150 GE4Ai-150 GE4Pi-150PRO GE4Ai-150PRO	GE4Pi-200 GE4Ai-200 GE4Pi-200PRO GE4Ai-200PRO	
Distance between centers		mm	Common	500	1,000	1,500	2,000	
Swing over table		mm	Standard accessory	φ320				
			Optional accessory	φ400				*1
Grinding diameter		mm	Common	φ0~φ300				
Load mass between centers		kg	Common	150				*2
Wheel	Wheel OD × ID	mm	Standard accessory	Type P: φ405 × φ127 Type A: φ455 × φ127				
			Optional accessory	Type P only: φ510 × φ203.2				
	Max. wide	mm	Standard accessory	75				
			Optional accessory	100(φ405, φ455) / 50(φ510)				
Surface speed	m/s	Standard accessory	33					
		Optional accessory	45					
Wheel spindle	Drive motor	kW	Standard accessory	Wheel surface speed 33 m/s specification: 3.7(4P)				
			Optional accessory	Wheel surface speed 45 m/s specification: 5.5(4P) Wheel external diameter 510 mm specification:				
Wheelhead	Rapid feed rate	m/min	Common	φ10				
	Min. input increment	mm	Common	φ0.0001				
Table	Rapid feed rate	m/min	Common	10		8		
	Min. input increment	mm	Common	0.0001				
	Swiveling angle *3	°	Common	12.5~0	10.0~0	8.5~0	4.0~0	
Workhead	Type	mm	Standard accessory	Dead spindle				
			Optional accessory	Live / dead spindle dual purpose				*4
	Center taper	MT	Common	No.4				
Footstock	Spindle speed	min ⁻¹	Common	21~500				*5
	Type	mm	Standard accessory	Manual type				
Optional accessory			Manual center adjustment type, hydraulic type etc				*4	
Electrical equipment	V	Common	Power supply voltage 200V		Control circuit DC24V			
			Work spindle	kW	Common	1.5		
Drive motors	Wheelhead feed	kW	Common	1.3				
	Table feed	kW	Common	1.8				
	Wheel spindle bearing oil pump	kW	Common	0.25(2P)				
	Fan cooler for wheel spindle bearing oil	kW	Standard accessory	0.035				
	Lubricant pump	kW	Standard accessory	0.04(2P)				
	Hydraulic oil pump *6	kW	Optional accessory	0.75(4P)				
	Coolant supply pump	kW	Common	0.18(2P)				*7
	Washing pump *8	kW	Optional accessory	0.18(2P)				
	Magnetic separator *8	kW	Optional accessory	0.025(4P)				
Tank capacity	Wheel spindle bearing oil	L	Common	15				
	Lubricant	L	Standard accessory	12				
	Hydraulic oil *6	L	Optional accessory	10				
	Coolant	L	Common	150				*7
Required floor space (width × depth) *9		mm	Common	3,600 × 1,920	4,600 × 1,920	6,130 × 1,920	7,700 × 1,920	
Machine weight *9		kg	Common	4,000	5,000	6,000	7,000	

The specification may be restricted according to the tooling of customer.

*1: The φ400mm swing specification is offered on a per-machine basis. Please consult with our sales department.

*2: Maximum spindle load for live / dead spindle workhead (option) is 40 kg (including workpiece and workpiece holder).

*3: For non-manual footstocks, table front covers (manual open / close) or full-cover specifications, the swivel angle is restricted.

*4: Refer to the list of accessories in the catalog (P. 24) for the type of workhead and footstock.

*5: Subject to change depending on workhead model type.

*6: If hydraulic oil is required for the auto sizer drive, a hydraulic oil tank is required as a special accessory.

*7: Subject to change depending on coolant tank type.

*8: The coolant tank with washing pump for base washing, table washing and auto-sizer cooling and the magnetic separator are special accessories.

*9: Subject to change depending on accessory parts, etc.



GE4Pi-INTER

Internal grinding specifications with the same user-friendliness of an external grinder

Same operational feel as external grinders

- + Reduction of operational / learning time
- + Prevention of hazardous events due to differences between internal and external grinding

Improved safety and workability

- + Easy measurement of inner diameter due to wheelhead retreating after machining

Professional specifications leveraging expert craftsmanship

- + Professional handle **Option**

Please see page 19

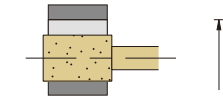
*However, button arrangement, etc. differs to the description



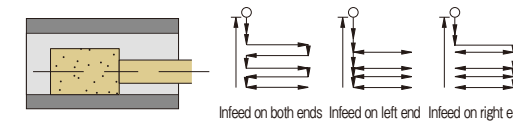
Grinding cycles (GE4i-INTER)

Internal grinding cycle

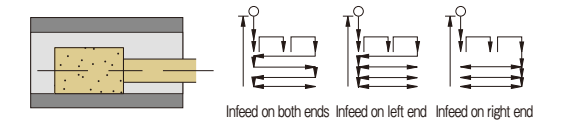
1. Plunge (indirect sizing)



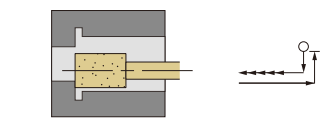
2. Traverse (indirect sizing)



3. Plunge / traverse (indirect sizing)



4. Right face

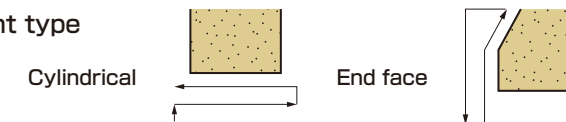


Notes 1: The above grinding cycles can be divided into rough and finish grinding cycles by using the cycle dividing function.
4: Only indirect sizing cycle is available (direct sizing cycle is not available) for the internal grinding cycle.

Wheel dressing cycles (GE4i-INTER)

TOYOPUC-GC70

Straight type



Please see page 22 "CNC Specifications"

Notes 1: Up to 5 patterns of wheel shape can be registered.
2: 3 wheel dressing conditions; "rough", "semi-finish" and "finish" can be set.

Machine specifications (GE4i-INTER)

Item	Unit	Specification	GE4Pi-50INTER	GE4Pi-100INTER	GE4Pi-150INTER	GE4Pi-200INTER
Workpiece length	mm	Common	500 *1	1,000 *1	1,500 *1	2,000 *1
Swing over table	mm	Standard accessory		φ320		
		Optional accessory		φ400		*2
Workpiece O.D.	mm	Common		~φ300		
		Optional accessory		~φ380		
Machining I.D.	mm	Common		~φ150		
Swing inside chuck cover	mm	Common		φ265		
Workpiece weight	kg	Standard		40		*3
		Optional accessory		60		*3
Wheel spindle	Drive motor	kW		2.2(2P), with inverter		
		Optional accessory		3.7(2P), with inverter		
Wheelhead	Rapid feed rate	m/min	Common	φ10		
	Min. input increment	mm	Common	φ0.0001		
Table	Rapid feed rate	m/min	Common	10		8
	Min. input increment	mm	Common	0.0001		
	Swiveling angle *4	°	Common	12.5~0	10.0~0	8.5~0
Workhead	Type	mm	Standard accessory	Live / dead spindle dual purpose		
	Spindle speed	min ⁻¹	Common	21~500		
Electrical equipment	V	Common	Power supply voltage 200V Control circuit DC24V			
Drive motors	Work spindle	kW	Common	1.5		
	Wheelhead feed	kW	Common	1.3		
	Table feed	kW	Common	1.8		
	Lubricant pump	kW	Standard accessory	0.04(2P)		
	Hydraulic oil pump *7	kW	Optional accessory	0.75(4P)		
	Coolant supply pump	kW	Common	0.18(2P)		
	Washing pump *9	kW	Optional accessory	0.18(2P)		
Tank capacity	Magnetic separator *9	kW	Optional accessory	0.025(4P)		
	Lubricant	L	Standard accessory	12		
	Hydraulic oil *7	L	Optional accessory	10		
	Coolant	L	Common	150		
Required floor space (width × depth) *10	mm	Common	3,600 × 1,920	4,600 × 1,920	6,130 × 1,920	7,700 × 1,920
Machine weight *10	kg	Common	4,000	5,000	6,000	7,000

The specification may be restricted according to the tooling of customer.

*1: Depending on quill length, the machining of workpieces with different lengths is possible. *2: The φ400mm swing specification is offered on a per-machine basis. Please consult with our sales department.

*3: Includes holder weight. *4: In the case of table front cover (manual opening type) full cover specifications and depending on machining position, there are limitations on the swing angle.

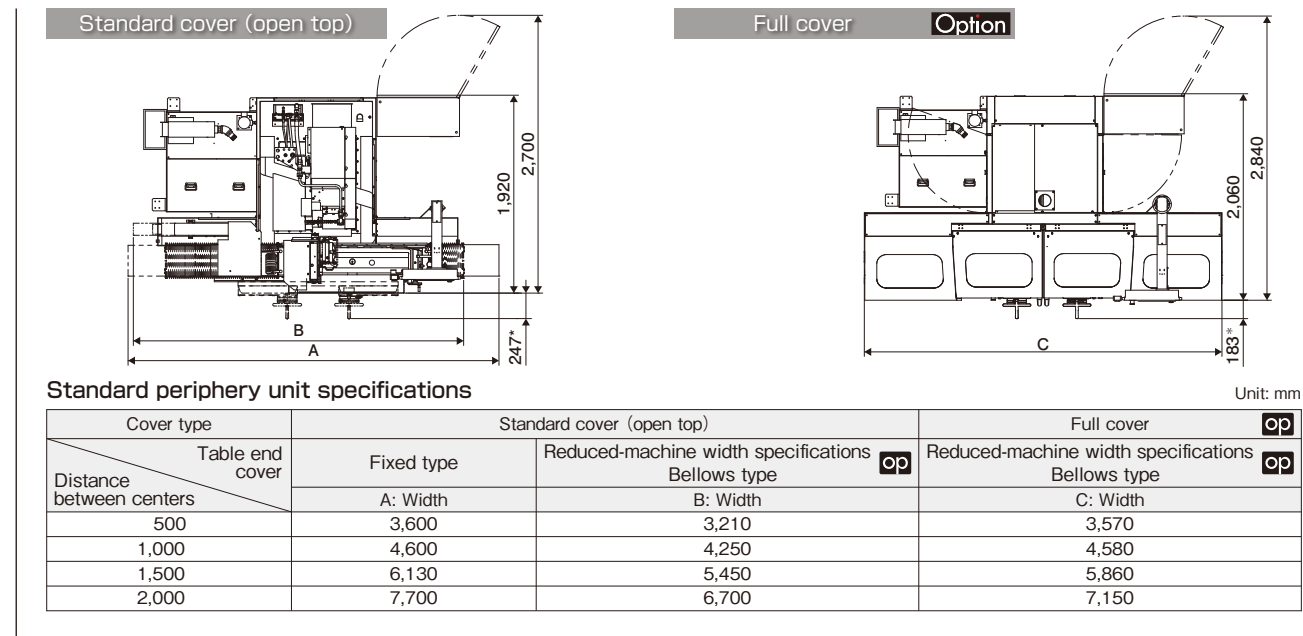
*5: Refer to the list of accessories in the catalog (P. 33) for the types of workhead. *6: Subject to change depending on workhead model type.

*7: If hydraulic oil is necessary for the lateral locator, etc., an optional hydraulic oil tank is required. *8: Subject to change depending on coolant tank type.

*9: The coolant tank with washing pump for base washing, table washing and auto-sizer cooling and the magnetic separator are special accessories.

*10: Subject to change depending on accessory parts, etc.

Machine layout (GE4i-INTER)



Cover type	Height of cover top face	Max. machine height
Standard cover (open top)	—	1,795*
Manual open/close type front cover op	1,280	1,795*
Full cover specification op	1,495	1,795*
Special full cover specifications (When equipped with ϕ 400 mm over-table swing and lateral locator) op	1,830	1,830

* Height of operation panel top face

*Dimensions of professional handle equipped.

op is special specifications

List of accessories (GE4i-INTER)

(When an optional A accessory is chosen, the corresponding standard one is not supplied.)

●: Standard accessory ○: Optional A accessory □: Optional B accessory

Category	No.	Unit name	Remarks	GE4i-INTER
Table	1	Table swivel unit		●
	2	Table swivel angle sensor Digital display	*1	□
	3	Table end cover (fixed type)		●
	4	Table end cover (bellows type)	Reduced machine width specification	○
	5	Table front Fixed cover		●
	6	Insert type Front cover		□
	7	Manual open and close Front cover	No confirmation device, no windows	○
	8	Manual open and close operation type Front cover Door close confirmation unit		○
	9	Swing on table ϕ 400 mm support		□
Workhead	10	Live / dead spindle workhead (infinitely variable speed, swiveling)	*2 Workpiece weight: 40 kg (including holder)	●
	11	Special live / dead spindle workhead (infinitely variable speed, non-swiveling)	Workpiece weight: 60 kg (including holder)	○
	12	Special live / dead spindle workhead (infinitely variable speed, swiveling)	*2,3 Workpiece weight: 60 kg (including holder)	○
	13	Spindle in-position stop unit (proximity type switch)		□
Wheelhead	14	2.2kW wheel spindle motor		●
	15	3.7kW wheel spindle motor		○
	16	Wheel surface speed variable speed unit (inverter control [deceleration only], manual adjustment)		●
Pump unit	17	Lubricant pump unit (12L)	No confirmation device for no oil	●
	18	Hydraulic oil pump unit (10L)	No confirmation device for no oil	□
Coolant supply unit	19	Coolant supply unit (150L)	No washing pump	●
	20	Coolant supply unit (230L)	No washing pump	○

*1: 100V power required. *2: Workhead position change is necessary when operating the machine by swiveling the workhead, as the workhead interferes with the wheel dresser mounted on the traverse table.

*3: Support for ϕ 400 mm over-table swing is required.

*4: Processing capability of approximately 1L/m for every 1mm of wheel width. Select a magnetic separator appropriate to the wheel width and coolant washing level. Also, select the 80L/min specification if base and table washing is to be carried out.

List of accessories (GE4i-INTER)

(When an optional A accessory is chosen, the corresponding standard one is not supplied.)

●: Standard accessory ○: Optional A accessory □: Optional B accessory

Category	No.	Unit name	Remarks	GE4i-INTER	
Coolant supply unit	21	Coolant supply unit with paper filter (48L collection tank, 300L tank, 40L/min processing capacity)	Without washing pump With sub tank for pumping	○	
	22	Coolant supply unit with paper filter (48L collection tank, 350L tank, 80L/min processing capacity)	Without washing pump With sub tank for pumping	○	
	23	Coolant supply unit (48L collection tank, 350L tank, select either 40L/min or 80L/min processing capacity (ferrite type))	With pump, with coolant cooling function With sub tank for pumping	○	
	24	Coolant supply unit (48L collection tank, 350L tank, select either 40L/min or 80L/min processing capacity (rare earth type))	With pump, with coolant cooling function With sub tank for pumping	○	
	25	High cleanliness type coolant supply unit K100 (48L collection tank, 190L primary tank, 260L secondary tank, magnet separator with 120L/min processing capacity)	With pump, with coolant cooling function With sub tank for pumping	○	
	26	Magnetic separator ferrite type (select either 40L/min or 80L/min processing capacity)	*4	□	
	27	Magnetic separator rare earth type (select either 40L/min or 80L/min processing capacity)	*4	□	
	28	Coolant lower limit confirmation device		□	
	29	Base, table washing	*4 Washing pump required	□	
Wheel dresser	30	Standard wheel dresser (traverse table mounted on workhead rear section)		●	
	31	Diamond holder for internal / external grinding (swivel table-mounted)		□	
	32	Formed diamond tool (shank diameter: 8mm)		□	
	33	Single-point diamond tool (shank diameter: 8mm)		□	
Tool	34	Tools (special-purpose tools)		●	
	35	Tools (wrench / spanner)		□	
Steady rest	36	3-point manual steady rest (ϕ 10~ ϕ 100mm, ϕ 100~ ϕ 200mm)		□	
	37	3-jaw scroll chuc (4", 5", 6", 7", 9" available)	*5	□	
	38	Independent 4-jaw chuck (4", 6", 8", 10" available)	*5	□	
Chuck	39	4-slot face plate (ϕ 228mm)		□	
	40	Automatic lateral locator	*6	□	
Lateral locator	41	Pneumatic unit		□	
Mist collector	42	Mist collector 1 set		□	
	43	Manual pulse generator (mounted on operation panel)		●	
Control unit	44	Table direction selection lever		●	
	45	Workhead spindle ON-OFF / inching switch		●	
	46	One USB flash drive for TOYOPUC-GC70 (JTEKT-made, backup data entered)		●	
	47	USB flash drive for TOYOPUC-GC70 (JTEKT-made)		□	
	48	100V power		□	
	49	100V outlet (mounted inside of control box)	*1	□	
	50	Machine front-face handle specifications	Pulse generator	□	
	51	Machine front-face handle specifications Professional handle spec.	Pulse generator	□	
	52	Signal tower - 3 color specification		□	
	53	Electrical leak breaker		□	
	54	Cabinet interior lighting		□	
	55	Automatic power isolation		□	
	56	Manual door close confirmation unit enable / disable switch	Manual door close confirmation unit is required	□	
	57	Lighting unit (LED / fluorescent type)	Cannot be included in the case of special full cover specifications	□	
	58	Lighting unit (LED / spotlight type)		□	
	Overseas supported	59	Multilanguage support	Please consult with us regarding available languages	□
		60	Supporting different voltage		□
Machine color	61	JTEKT standard paint color (silver metallic, dark gray metallic, dark gray)		●	
	62	Specified color other than JTEKT's standard specified color Machine body only 1 color		○	
Customer's run off test	63	JTEKT's standard TP grinding		□	
Instruction manual	64	Machine specifications, operation manual, maintenance manual, electric control drawings - 1 copy each (CD)	Submitted in CD form	●	
	65	Machine specifications, operation manual, maintenance manual, electric control drawings - 1 copy each (bound)	Will bind and deliver	□	
Special cycles	66	Right-face cycle		●	
	67	Full-cover specifications	*7 Manual open / close type	○	
Full cover	68	Door close confirmation unit	*7 Manual open / close type	○	
	69	Wheelhead linear scale	Linear scale pneumatic unit is required	○	
High-accuracy support	70	Table linear scale	Linear scale pneumatic unit is required	○	
	71	Linear scale pneumatic unit		□	
	72	Thermal displacement correction sensor Distance sensor between wheelhead and table		○	
	73	Wheelhead / workhead coolant cooler (cooling with coolant)	*8 Coolant supply unit with coolant cooling is required	○	

*5: Depending on wheel shape, there is a possibility that the wheel may interfere with the chuck cover during wheel dressing. Check before performing wheel dressing.

*6: Hydraulic oil pump unit required. *7: Please contact us, when equipped with ϕ 400 mm over-table swing and lateral locator. *8: Inclusion may not be possible depending on spindle type.



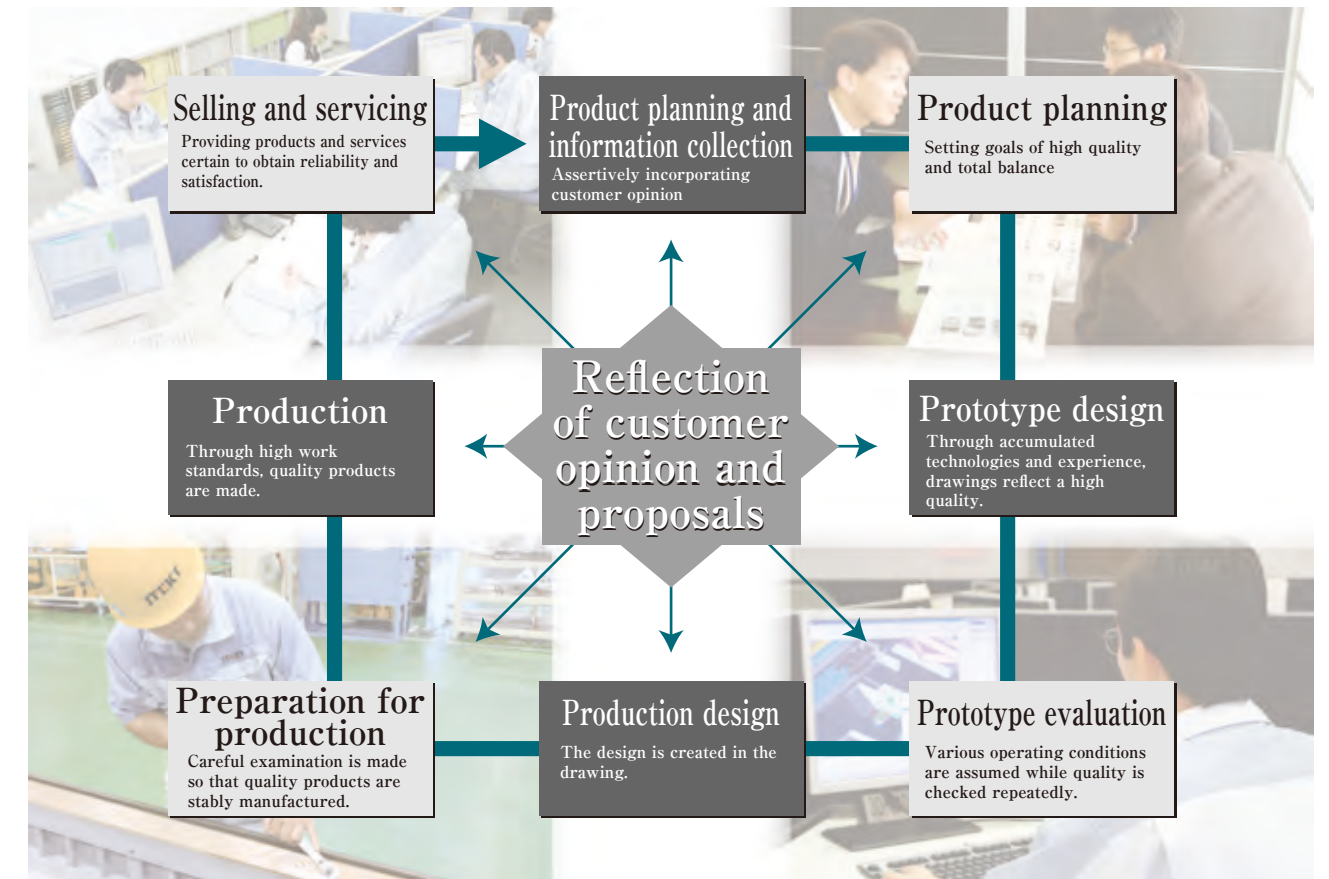
The pursuit of Reliability - one of JTEKT's starting points

Stable accuracy and an improved MTBF (mean time between failures) are both necessary in order for the customer to feel assured with reliability. Our products are high quality and high performance to ensure machining longevity.



JTEKT don't take quality and performance as a given - we work for it.

When manufacturing a machine, JTEKT begin with understanding various customer needs and establishing a total control system, starting with a product design based on dedicated R&D activities through to a rigid quality control processes that ensure stable production.



JTEKT's leading edge technical development strength. This strength is supported by fundamental technologies ranging across various fields such as tripology, nano technology, material development and cutting technologies, heat treatment, control technology and much more.

Creating a feeling of assurance through the accumulation of material technology: Professionals majoring in material technology use cutting edge equipment to analyze and evaluate.

Research and development operations in Kariya, Aichi Pref.



Material Technology Research Div., Research and Development operations



Using X-ray photoelectron spectroscopy to analysis fine matter adhered to a machined surface



Using a transmission electron microscope to survey metal structure

- Machined surface analysis(ultra precision field)
- Machining stress measurement
- Paint evaluation ● Coolant immersion evaluation
- Material mixture evaluation, etc.

“People” are the starting point

Skilled engineer fostering program

JTEKT (former Toyoda Machine Works) opened a skilled worker training school in 1941 under the principle of “good machines are created by excellently skilled engineers.” In 1957, a three-year training course for junior high graduates was started, based on the Job Training Law established by the Labor of Ministry at the time. In 1977, courses were integrated to a one-year training course for senior high graduates, which has since produced many superiorly skilled engineers, contributing not only to industry but society also.

1941	Opening of the skilled engineer training school(1 yr program)
1957	Opening of a 3-yr training course for junior high graduates as a skilled engineer training school under the Job Training Law
1977	Integration of senior high school graduate training(2 streams)
1980	Presented with a 'blue-chip training school' award from the Labor Minister (second time)
1981	Presented with a 'blue-chip skill certification institution' award from the Labor Minister
1983-84	Two-year consecutive victory in the Japan national olympic convention(casting division)
2003	Presented with a 'blue-chip training school' award from the Ministry of Health and Labor
2006	Recommencement of the Skills Competition
2007	Accepts JTEKT Technical Training Center students from JTEKT group companies
2014	Awarded the JAVADA Chairman's Award for promotion of international cooperation projects
2017	Participated in the World Skills Competition for mechanical drawing

To become engineering or skilled professional workers

Knowledge

Acquisition of rich liberal arts and a diverse professional knowledge

Professional knowledge

- Production engineering
- Mechanical engineering
- Mechanical drafting
- Electrical engineering
- Cost control
- Mechanical maintenance
- ISO14001-ISO9001
- Measurement method
- Quality control
- JTEKT production method
- Industrial safety

Engineering method

(Material, Material dynamism, Mechanical engineering method, Electricity and Heat treatment)

General liberal arts

English & interpersonal communication skills

Module certification lesson

Qualification

- Slings lecture
- Wheel change
- Arc welding
- Low voltage electricity handling

National qualification skill examination(theory and practice)

Assistant engineer qualification
(Level 2 national qualification skill exam exempted)

Skills

Acquisition of a wide-range of fundamental professional skills and the capacity to apply knowledge

Rotational practic

Lathe, Milling machine and Machining center
Manual finishing, Machine assembly, Electrical, PC

Shop floor practical activities

First-hand experience of the quality, speed and material flow on the shop floor

Professional practice(strengthening specialty skills)

Machine assembly course(machine assembly, hydraulic and pneumatic pressure, electrical, machining centers)
Electrical course(switch board assembly, PC, hydraulic and pneumatic pressure, electricity and maintenance)
Casting course(casting)

Group creation lesson



English conversation class



PLC practicum



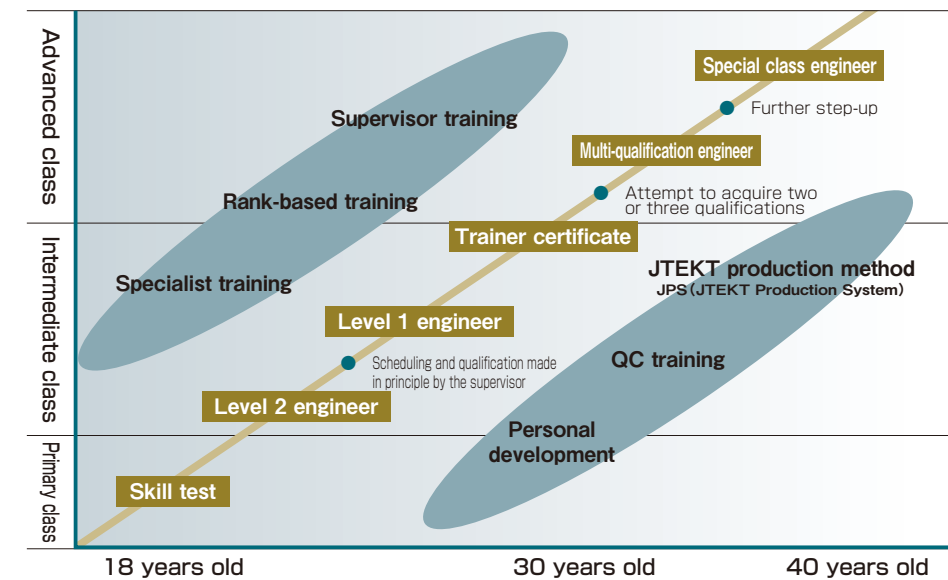
Overseas training / plant tour



Graduation ceremony



Footsteps of skilled engineers after graduation



Skilled engineer award record

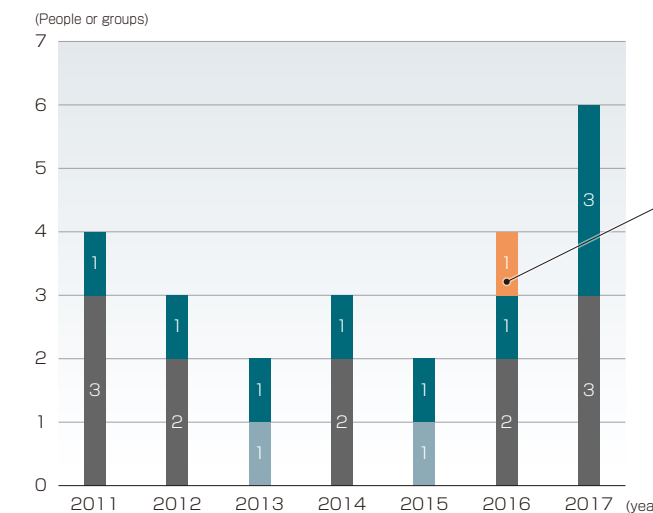
Yellow ribbon prize
18 awardees

Outstanding engineer
23 awardees

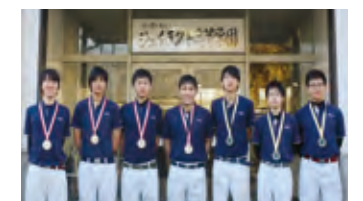


National Skills Competition award winners* in japan

Gold medal Silver medal Bronze medal Fighting-spirit award



In the 2016 National Skills Competition, obtained first prize in the mechanical drawing category.



Participated in the 2017 World Skills Competition (Abu Dhabi, UAE) Received a Fighting-Spirit Award



A convincing before-after sales system centered on a permanent exhibition site

JTEKT's Customer Center was opened in Kariya, Aichi Pref. in 1999 as one of the largest permanent exhibition sites in Japan. The sales, before-sales and after-sales service and training school divisions accepting direct contact with customers are integrally located in this center so that the best solution to meet customer's requirements can be found.



Customer center outline
 Location: 1-1 Asahimachi, Kariya-shi, Aichi Pref.
 Opened in October 1999
 Exhibition area: 2,110m²
 Permanent exhibition: Grinders, machining centers, cutting machines, etc.

At the customer center the best solution for the customer's requirements are proposed on a 3 element basis. We hope that you will take the time to visit.

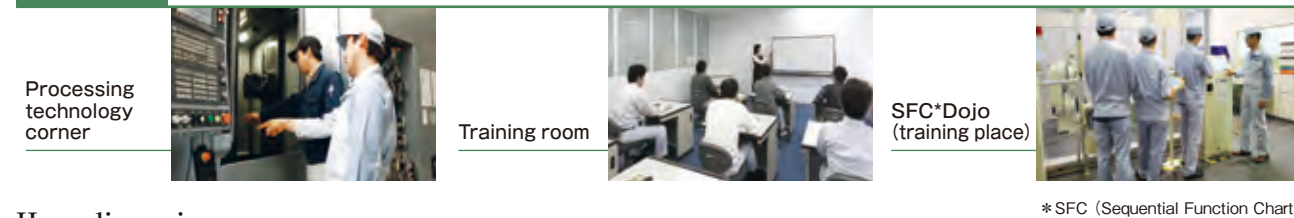
Observe

- Exhibition**
- Exhibition of cells/machines most suited to the customer
 - Introduction to leading edge technologies
 - Exhibition of total engineering potentials including those of group companies



Touch and confirm

- Confirm**
- Confirmation of technology by carrying out before-sales service tests
 - Education of SFC, personnel training
 - Operation training at the training school



* SFC (Sequential Function Chart)

Have discussions

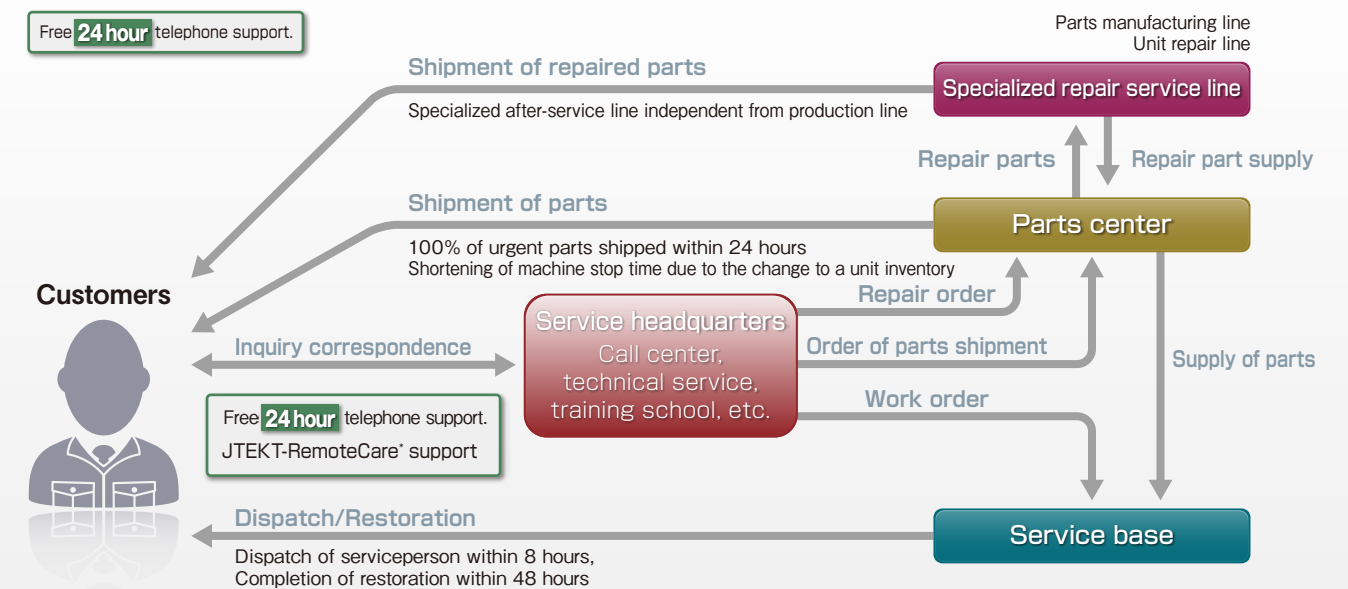
- Consultation**
- Technical exchange meeting by DE* utilization
 - Exchange of the latest information through events
 - Machining consultation before the machines



* DE (Digital Engineering)

Speedy and precise customer correspondence.

We have established Service Headquarters in Japan to consolidate the management of customer equipment information, and have arranged a system where call centers allow direct correspondence with customers, and parts can be supplied quickly.



- Utilizes a high-level search engine and text mining to search and mine large amounts of data from the customer or machine in order to propose optimal solutions in the shortest amount of time.
- Dispatch of serviceperson within 8 hours Completion of repairs within 48 hours
- Shipment of urgent parts within 24 hours

* Remote diagnosis system (option)

Global service extending throughout the World

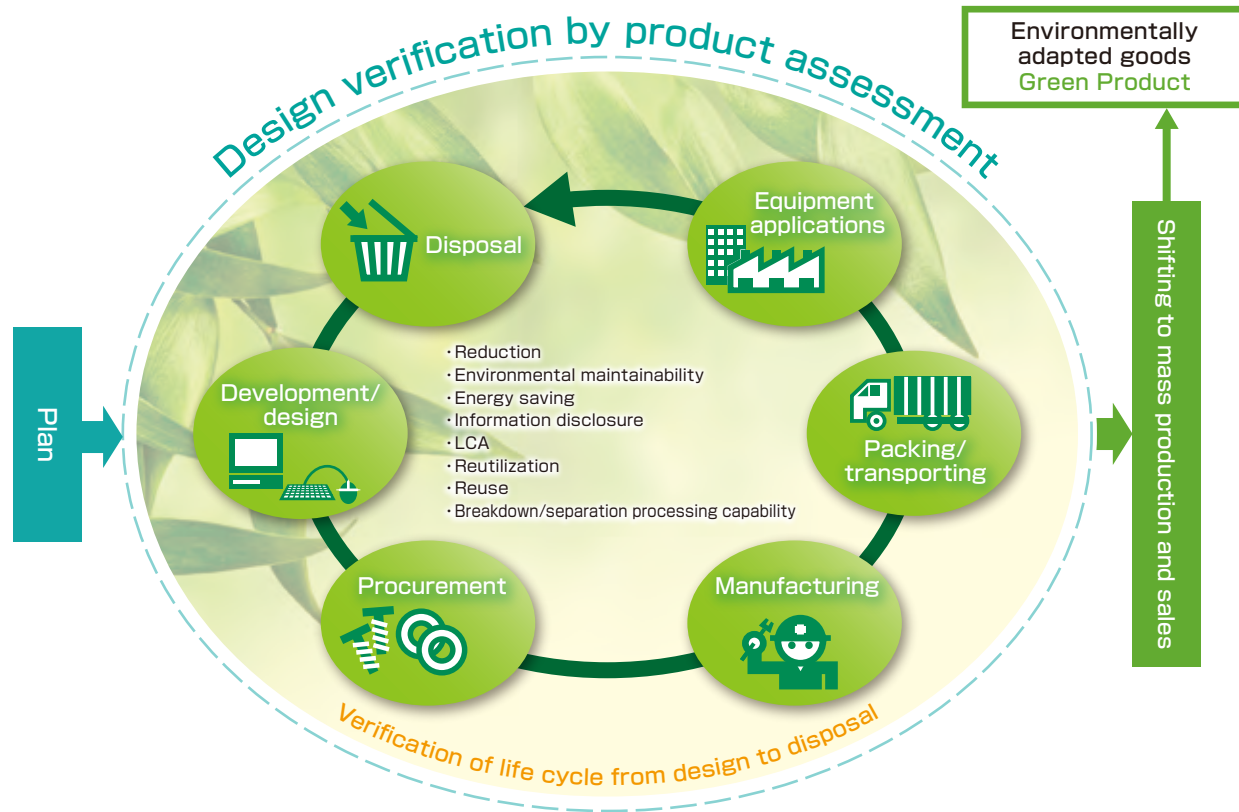
JTEKT shares a strong cooperation with its overseas base offices, and is able through these offices to provide secure and reliable service on a global scale. Our specialists have received rigorous training in order to support customers in every way, all throughout the world



Developing and supplying environmentally-friendly products (energy-saving, resource-saving)

Product development with minimal environmental burden through product assessments

1. JTEKT perform a product assessment which assesses and verifies the environmental load throughout a product's entire lifecycle, from the development and design stages.



2. In order to evaluate the environmental adaptability of each product we use a method that calculates the evaluation indicators throughout the target product's life cycle

Assessment items	Life cycle	Assessment points
Reduction	Manufacturing • packing/transportation • equipment application	Improved resource-conservation Yield Standardization Extraordinary long-life products
Environmental maintainability	Manufacturing • packing/transportation • equipment application • disposal • procurement	Toxic properties Hazardous properties Explosiveness Danger capacity
Energy saving	Equipment application/manufacturing	Energy saving Little wear Improved efficiency
Information disclosure	Equipment application/separation	Provision of handling information Provision of information at the time of product disposal

Eco-Scale

JTEKT perform our own Eco-Scale actions in order to more closely examine assessment indicators concerning the environment.



Eco-Scale
22.4
5% reduction

Assessment indicator = Eco-scale (0 to 100). The smaller the number, the better.

Reduction percentage compared to the conventional product.

CO₂
19.5% reduction

JTEKT display the Eco-Scale as well as the CO₂ reduction percentage.

3. Environmental consideration in the product development stage

Minimization of dimensional variation reduces energy consumption

By grinding parts to tolerances from the start, shops can reduce regrinding time and energy consumption.

CBN wheel reduces wheel chip discharge

By adopting a CBN wheel, the discharge of wheel chips has been significantly reduced compared to a standard grinding wheel.

High-accuracy package B eliminates warm-up time

This package maintains stable dimensional accuracy from a cold start, significantly reducing energy consumption by eliminating warm-up operation time.

High-cleanliness coolant tank reduces coolant waste

Achieve zero emissions with the adoption of a cyclone method, which replaces filter paper and its associated waste. Moreover, the dress interval has been extended, thereby reducing running cost. By more effectively filtering out bacteria, the coolant replenishment cycle has been significantly extended, reducing waste coolant.

A model of energy reduction

Energy consumption during grinding and waiting

