



YAMAZAKI MAZAK CORPORATION

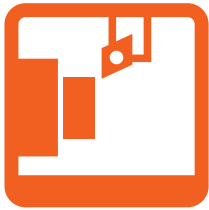
1-131 Takeda, Oguchi-cho, Niwa-gun, Aichi-pref., Japan
TEL : +(81)587-95-1131 FAX : +(81)587-95-2717

www.mazak.com

- Specifications are subject to change without notice.
- This product is subject to all applicable export control laws and regulations.
- The accuracy data and other data presented in this catalogue were obtained under specific conditions. They may not be duplicated under different conditions. (room temperature, workpiece materials, tool material, cutting conditions, etc.)

QT-PRIMOS series 17.03.0 S 99J1A1317E0

QT-PRIMOS SERIES



50 SG
100 SG
150 SG

QT-PRIMOS
S E R I E S

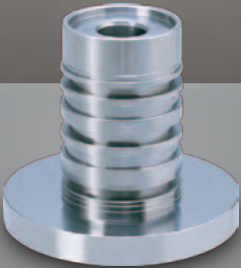


Compact, high-performance CNC turning center

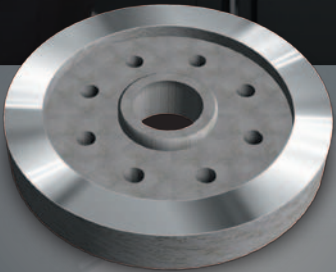
QT-PRIMOS SERIES



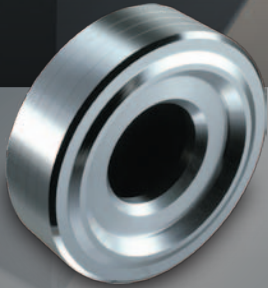
Example workpieces



Automotive component Material : S10C
Size : $\Phi 20\text{ mm} \times 40\text{ mm}$



Automotive component Material : Stainless steel
Size : $\Phi 100\text{ mm} \times 20\text{ mm}$



Automotive component Material : S45C
Size : $\Phi 60\text{ mm} \times 30\text{ mm}$

- Less floor space
- Integral spindle / motor for high-accuracy, high-speed machining
- Increased ease of operation and maintenance
- Large variety of options for increased productivity
- Choice of CNC : Mazak FZ or MAZATROL SmoothC

Mazak FZ



MAZATROL *SMOOTH C*



QT-PRIMOS 50 SG

Chuck size	5"
Spindle speed	5000 rpm
Output (40 % ED)	7.5 kW (10 HP)
Output (Cont. rating)	5.5 kW (7.5 HP)
Torque	47.7 N·m
Spindle bore	$\Phi 45\text{ mm}$

QT-PRIMOS 100 SG

Chuck size	6"
Spindle speed	5000 rpm
Output (40 % ED)	9 kW (12 HP)
Output (Cont. rating)	7.5 kW (10 HP)
Torque	75 N·m
Spindle bore	$\Phi 45\text{ mm}$

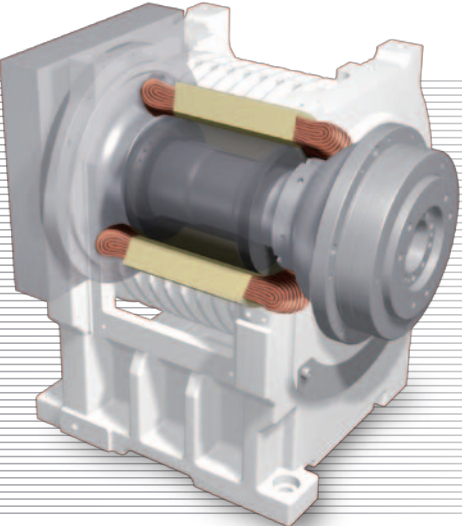
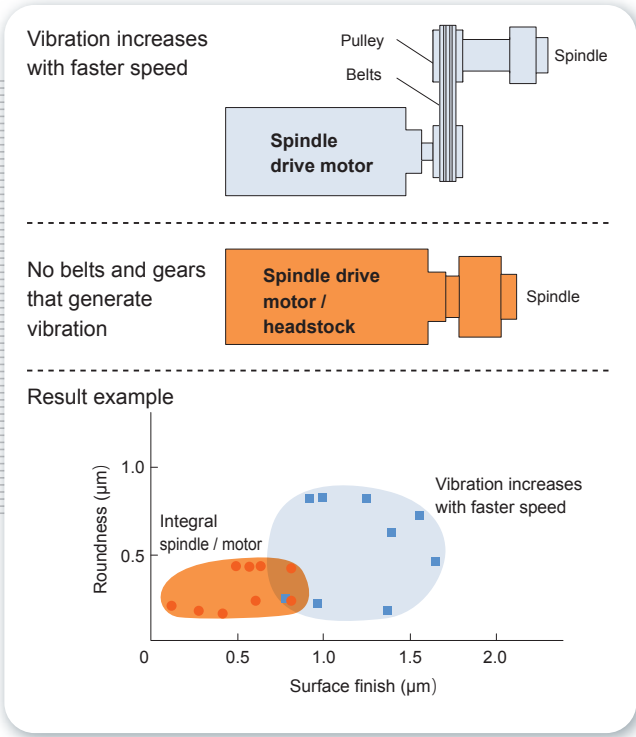
QT-PRIMOS 150 SG

Chuck size	8"
Spindle speed	4000 rpm
Output (40 % ED)	11 kW (15 HP)
Output (Cont. rating)	11 kW (15 HP)
Torque	131 N·m
Spindle bore	$\Phi 61\text{ mm}$

Higher Productivity

Rigid integral spindle / motor for unsurpassed machining performance

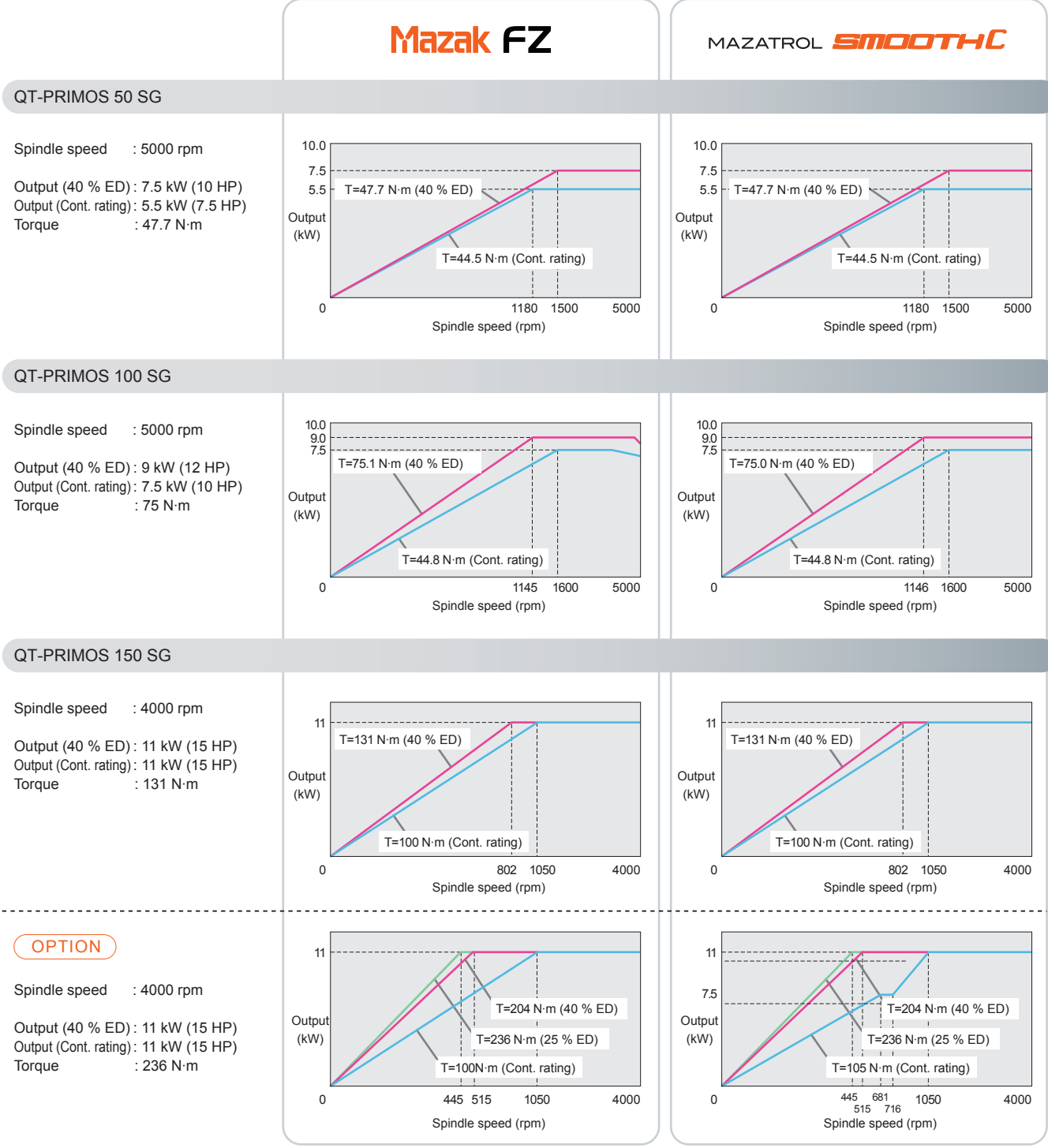
The integral spindle / motor uses no gears or belts which can cause vibration during machining. With no need for replacement or maintenance on belt-drive parts, long periods of maintenance-free operation can be ensured.



Thanks to no source of vibration (from gears or belts), high-speed, high-accuracy machining is performed by the integral spindle/motor. In addition, high spindle acceleration/deceleration rates contribute to increased overall efficiency and productivity.

Designed for high-performance

The spindle is designed to provide high-rigidity machining thanks to the high-torque machining capability in the low-speed range. Additionally, the high-speed acceleration and deceleration enhances productivity.



Higher Productivity

Turret

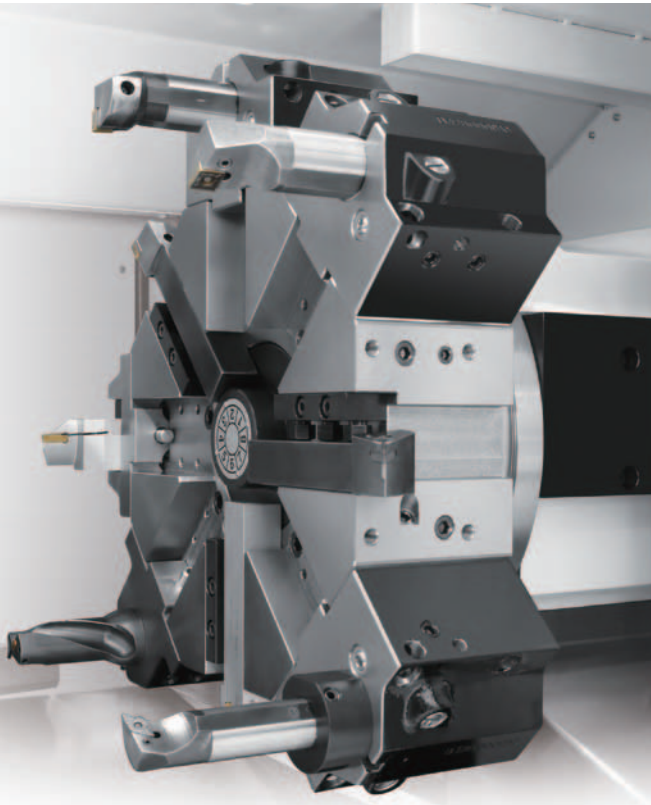
The QT-PRIMOS series is equipped with a servomotor driven, drum turret that features high-speed, non-lift turret indexing.

QT-PRIMOS
50 SG , 100 SG

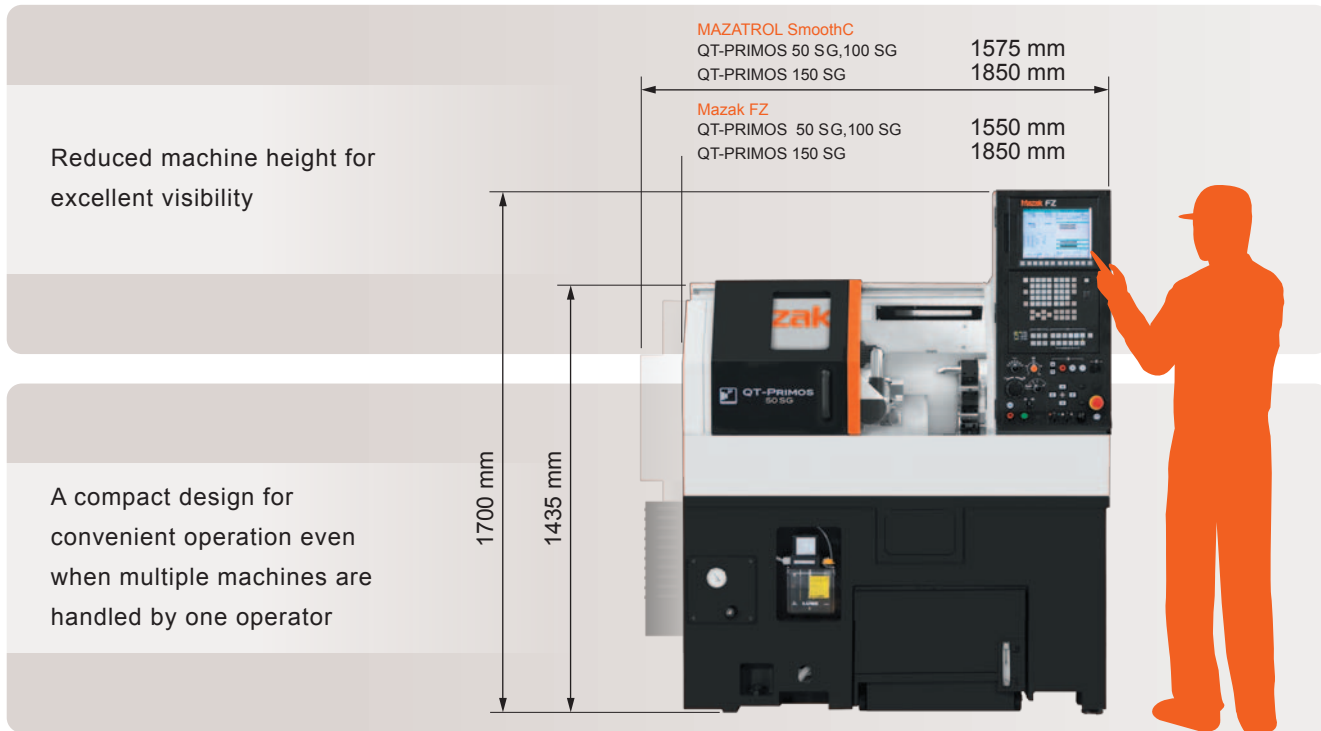
OD turning, facing tool □20 mm
Boring bar ø20 / 25 mm (Selection)
Indexing time 0.2 sec (one position)

QT-PRIMOS
150 SG

OD turning, facing tool □25 mm
Boring bar ø32 mm
Indexing time 0.2 sec (one position)

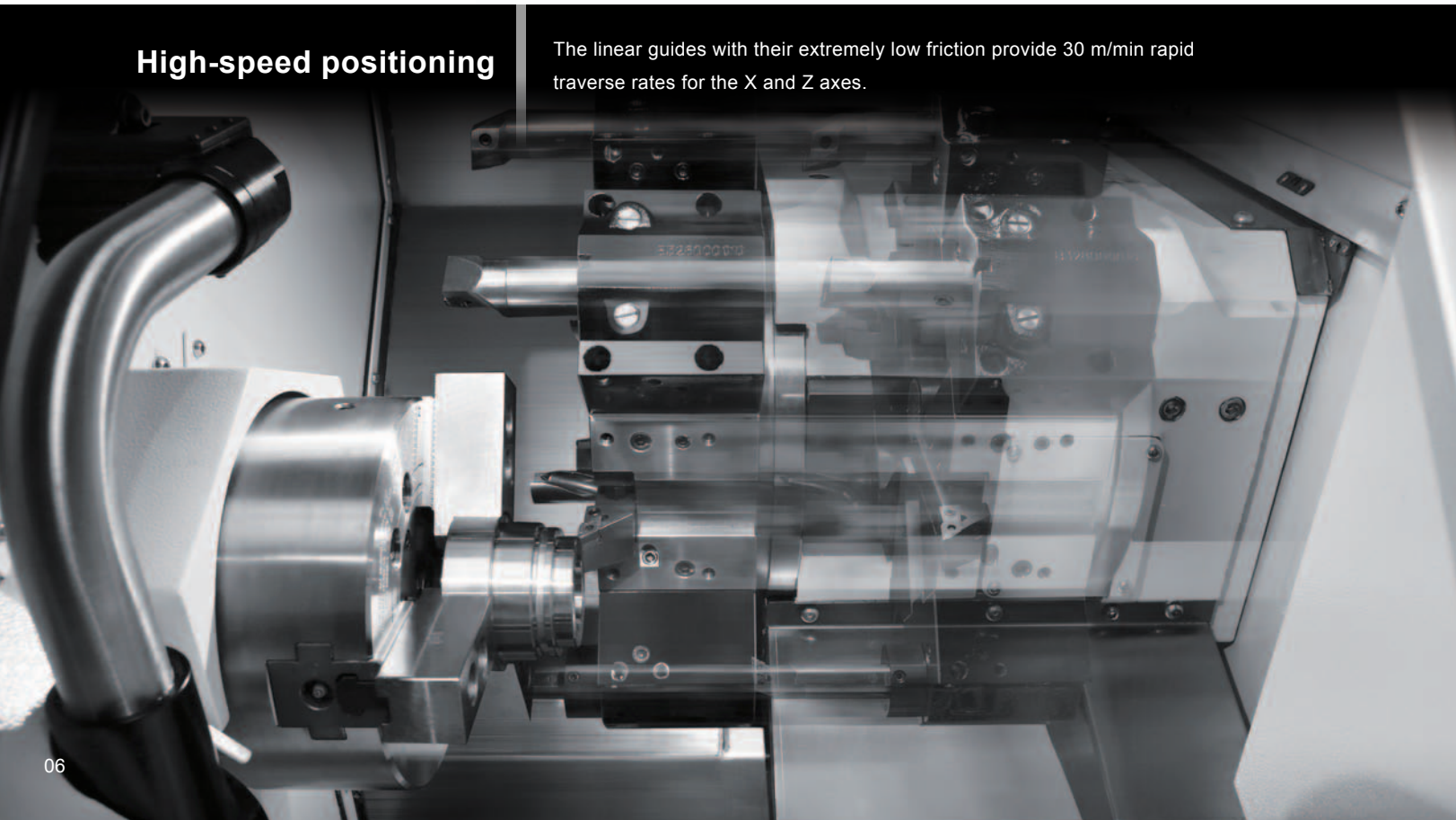


Compact design with less space = maximum floor space utilization



High-speed positioning

The linear guides with their extremely low friction provide 30 m/min rapid traverse rates for the X and Z axes.

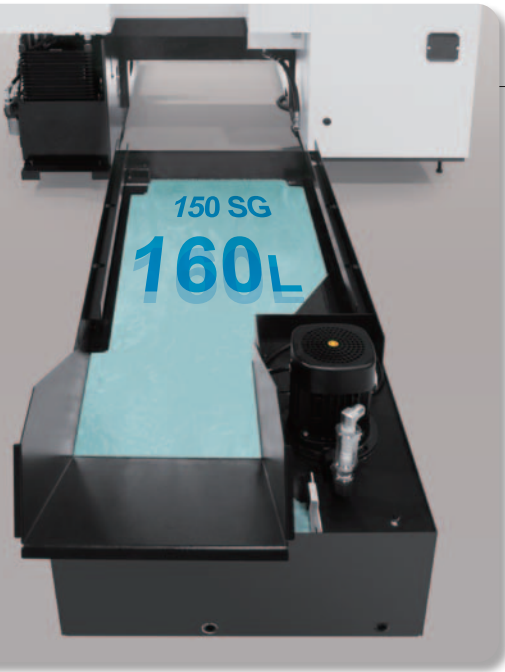


Designed for convenient maintenance

The lubrication oil tank is located in front of the machine. The other items requiring daily checking are also located in front and back of the machine for easy maintenance when the machines are located in a production line.



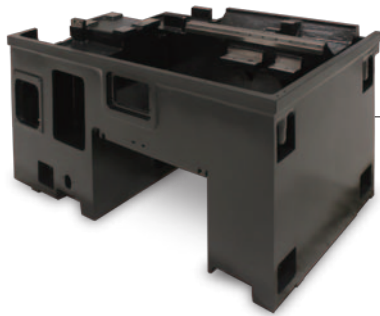
Higher Accuracy



Large capacity chip pan

50 SG, 100 SG **130 L** 150 SG **160 L**

The large capacity chip pan reduces the coolant temperature rise to ensure high-accuracy machining. For stable machining accuracy even during continuous machining, the coolant tank and the bed are separated to prevent heat transmission from cutting chips and coolant.



High-rigidity bed

The QT-PRIMOS series realizes stable machining accuracy by using a high-rigidity bed with box-shaped design.

Continuous machining accuracy

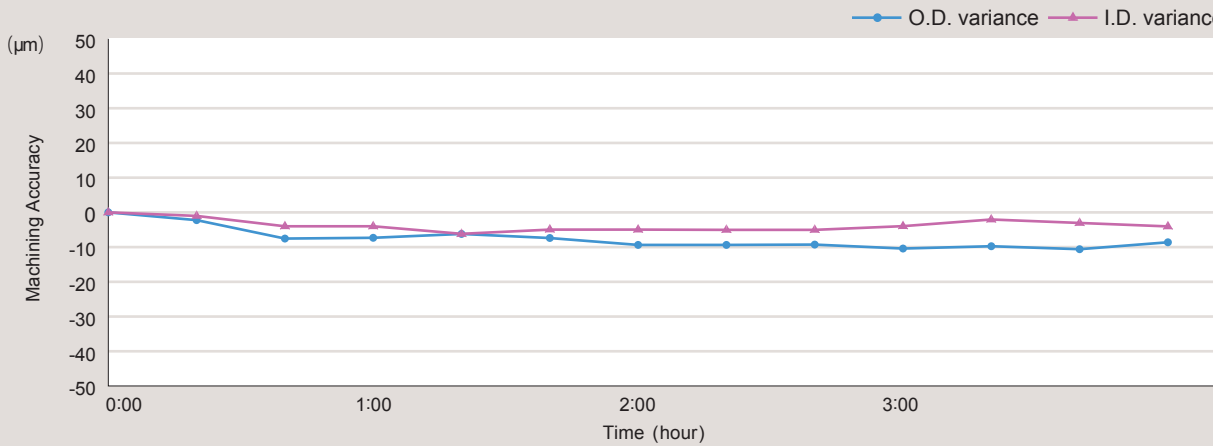
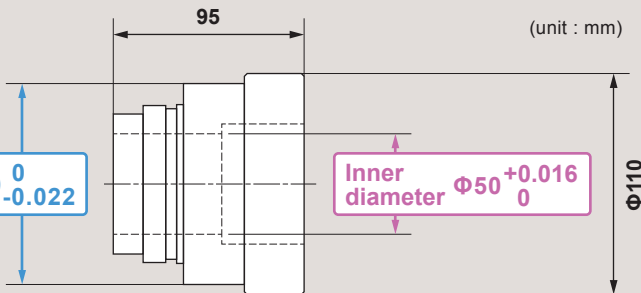
*We have carried out cutting tests under actual cutting conditions, including roughing. This champion data is not only to appeal the high-accuracy capability but also to serve as an indication of the practical ability in actual machining application.

*Results here serve as reference, and may not be duplicated under different conditions.

QT-PRIMOS 150 SG
material : S45C

Outer diameter $\Phi 100 \begin{smallmatrix} 0 \\ -0.022 \end{smallmatrix}$

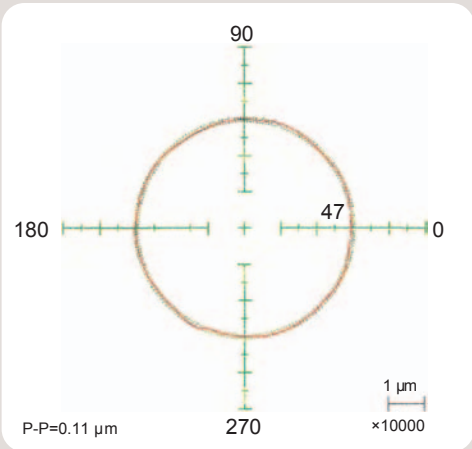
Inner diameter $\Phi 50 \begin{smallmatrix} +0.016 \\ 0 \end{smallmatrix}$



High-accuracy machining

Example results for reference only

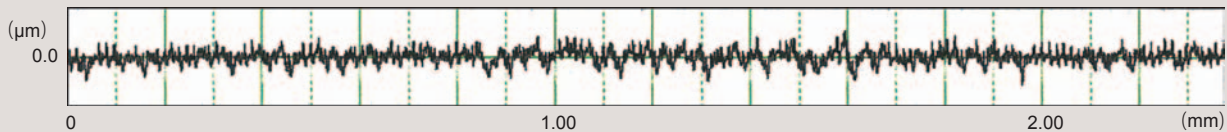
Machine model	QT-PRIMOS 150 SG	
Material	High-speed cutting brass JIS C3604	
Material size	ø70 × 100 mm	
Spindle speed	3500 rpm	
Machining conditions	Feedrate	0.015 mm/rev
	DOC	0.02 mm
Tool	Sintered diamond tool (R0.4 mm)	



High Accuracy Roundness

0.11 μm

Surface Roundness (Vertical magnification: ×10,000 Horizontal magnification: ×50)



Surface Finish

Ra 0.058 μm

Rz 0.389 μm

Heat displacement control ensures high-accuracy machining during changes in the ambient temperature

Heat Displacement Control

THERMAL SHIELD

The QT-PRIMOS series realizes enhanced continuous machining accuracy. Mazak has performed extensive testing in a variety of environments in a temperature controlled room and has used the results to develop a control system that automatically compensates for temperature changes in the machining area.

Automation

A variety of factory automation equipment is optionally available to meet your production requirements

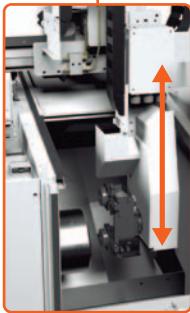
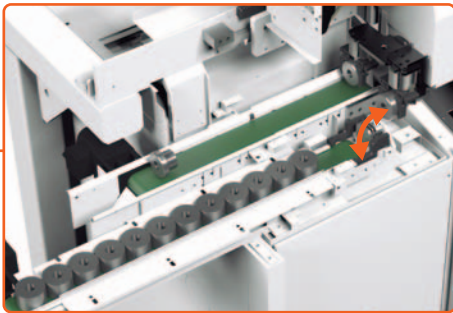
Quick Loader

Compact floor space automation system

- Continuous machining automatic loading / unloading
- Same floor space as standard machine
- Work output conveyor and work input chute are on the left side of the machine for continuous operation



QT-PRIMOS 50 SG + QL 01
Mazak FZ shown



Gantry Loader

Unmanned operation system for a wide range of applications

- Turn-over Unit (option) can be attached to machine
- The material / finished workpiece can be loaded on the pallet up to a height of 350mm to increase unmanned operation
- Teaching function for Gantry loader operation

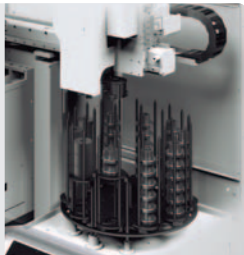


QT-PRIMOS 100 SG + GL 01
Mazak FZ shown

Work conveyor

The number of pallets can be selected :

- GL 01: 10, 20 pallets
- GL 03: 6, 20 pallets



Production check

With a push of a button, a finished part can be called out, via a gravity chute, for inspection check

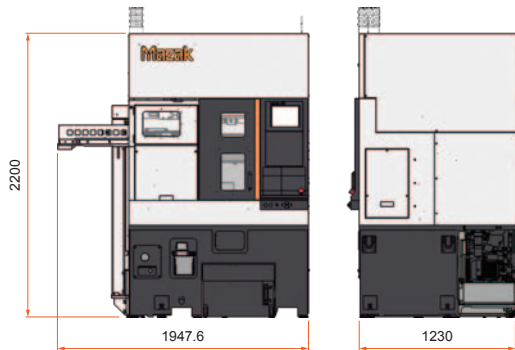
Quick Loader and Gantry Loader specifications

		Quick Loader		Gantry Loader	
Type		QL 01	QL 03	GL 01	GL 03
Model		50 SG, 100 SG	150 SG	50 SG, 100 SG	150 SG
Workpiece	Reference diameter	ø20~ø60 mm	ø20~ø80 mm	ø20~ø90 mm	ø30~ø125 mm
	Weight (per 1 hand)	1.0 kg	1.5 kg	1.5 kg	3.0 kg
Traverse speed	Traveling axes (machine, B-axis)	100 m/min	100 m/min	180 m/min	180 m/min
	Vertical axis	100 m/min	100 m/min	140 m/min	140 m/min
Work conveyor	Pallet height	-	-	350 mm	350 mm
	Workpiece diameter	-	-	ø20~ø90 mm	ø20~ø150 mm
	Pallet weight capacity	-	-	15 kg/pallet	30 kg/pallet

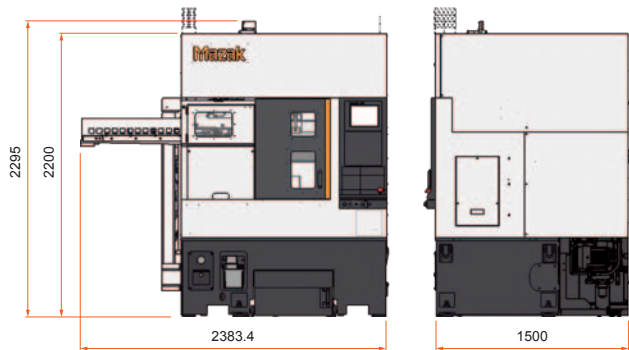
Quick Loader dimensions

Unit : mm

■ QT-PRIMOS 50 SG, 100 SG + QL 01

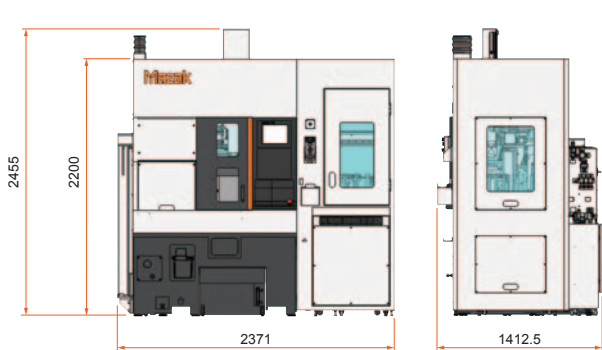


■ QT-PRIMOS 150 SG + QL 03

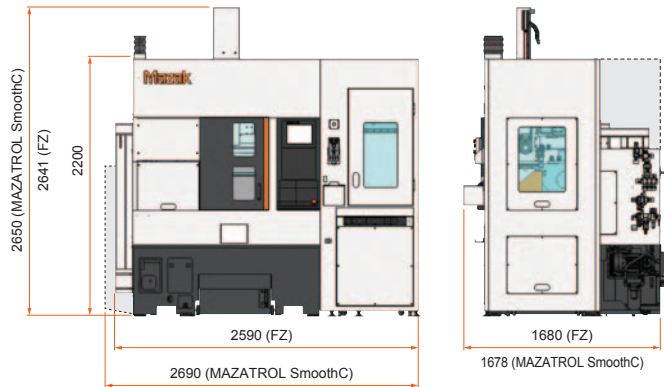


Gantry Loader dimensions

■ QT-PRIMOS 50 SG, 100 SG + GL 01



■ QT-PRIMOS 150 SG + GL 03



Ease of Maintenance

Ergonomic design for convenient operation

Large front window

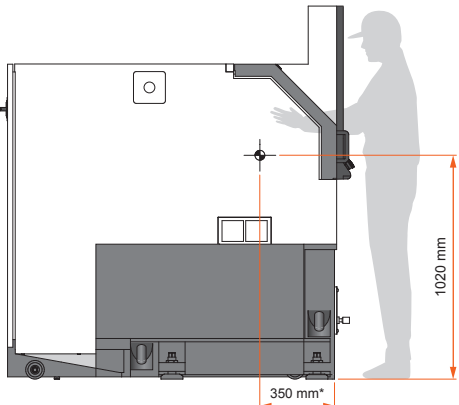
The front window, reclined at 45°, allows machining operation to be easily monitored by the operator.

Small, lightweight front door

The front door is designed for ease of opening and closing while at the same time providing a large opening to reduce the load on the operator.

Convenient access

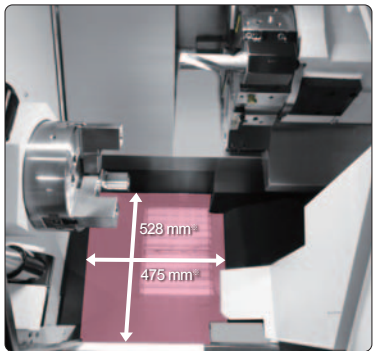
The spindle center line is a short distance from the front of the machine.



*QT-PRIMOS 150 SG

Designed for smooth chip disposal

The bottom of the machining area is completely open to facilitate chip disposal.



*QT-PRIMOS 150 SG

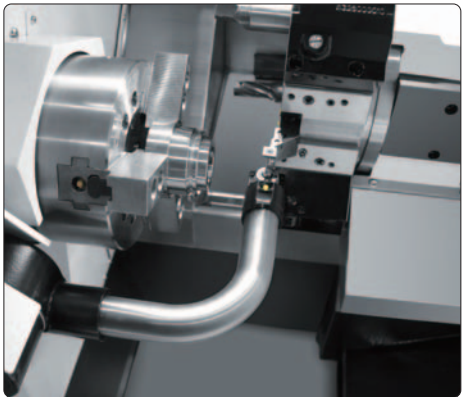
MAZATROL SmoothC shown



Option

Tool eye

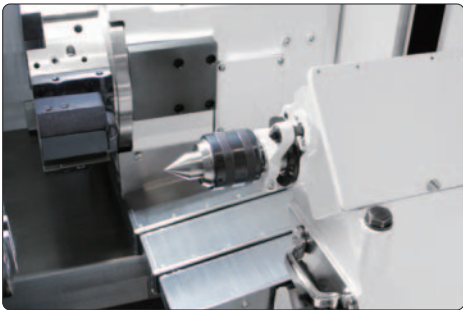
The Tool Eye can be programmed for automatic tool measurement and compensation as well as inspection for tool breakage.



Tailstock

OPTION

Tailstock for shaft workpieces is optionally available. The motion of the tailstock quill can be commanded by M-code. (The tailstock body is manually positioned)



QT-PRIMOS 50 SG / 100 SG

Tailstock quill MT No.3

QT-PRIMOS 150 SG

Tailstock quill MT No.4

Standard and Optional Equipment

●: Standard ○: Option —: N/A

			50 SG	100 SG	150 SG				50 SG	100 SG	150 SG		
Machine	5" non through-hole chuck	N-05	○	—	—	Factory automation	Automatic power off			○	○	○	
	5" through-hole chuck	B-205	●	—	—		Operation end buzzer			○	○	○	
	6" non through-hole chuck	N-06	—	○	—		Work counter			○	○	○	
	6" through-hole chuck	B-206	—	●	—		Status light	1 color		○	○	○	
	8" non through-hole chuck	N-08	—	—	○			3 colors		○	○	○	
	8" through-hole chuck	B-208	—	—	●	Safety equipment	Chuck open/close confirmation			●	●	●	
	Collet chuck	SAD-40	○	○	—		Hydraulic pressure interlock			●	●	●	
		SAD-50	—	—	○		Foot pedal switch for chuck	Single		○	○	○	
					Double				●	●	●		
	Tailstock (dead center)	MT No. 3	○	○	—		Air pressure interlock			○	○	○	
		MT No. 4	—	—	○	Overload detection system			○	○	○		
	Tailstock (Live center)	MT No. 3	○	○	—	Feed axes emergency stop function			●	●	●		
		MT No. 4	—	—	○	Coolant / Chip disposal	Chip pan	Without chip conveyor		●	●	●	
	LED worklight		●	●	●		Chip conveyor	Hinge	Preparation		○	○	○
	Tooling package		●	●	●				Rear disposal		○	○	○
Set of adjusting tools		●	●	●	Chip bucket		Fixed		○	○	○		
Multi-tap transformer		●	●	●				Swing		○	○	○	
Special machine color		○	○	○	Coolant system		250 W		●	●	●		
Factory automation	Absolute positioning system			●	●	●	High power coolant	520 W		○	○	○	
	Spindle orient			○	○	○		1.1 kW (1.5 HP)		—	—	○	
	Tool eye	Automatic		●	●	●		Additional coolant nozzle (headstock side)		○	○	○	
		Manual		○	○	○	Turret air blast		○	○	○		
	Automatic chuck jaws open / close			○	○	○	Mist collector		○	○	○		
	Chuck air blast			○	○	○	Coolant temperature control		○	○	○		
	Bar feeder interface			○	○	○	CNC	MAZATROL SmoothC		Selectable			
	Automatic parts catcher			○	○	○		Mazak FZ					
	Automatic parts output conveyor			○	○	○		Above specifications are for European market. Standard and optional equipment vary by market.					
	Automatic front door			○	○	○							
	Gantry loader			○	○	○							
	Quick loader			○	○	○							

Above specifications are for European market. Standard and optional equipment vary by market.

Ease of Programming

Operator-friendly CNC system

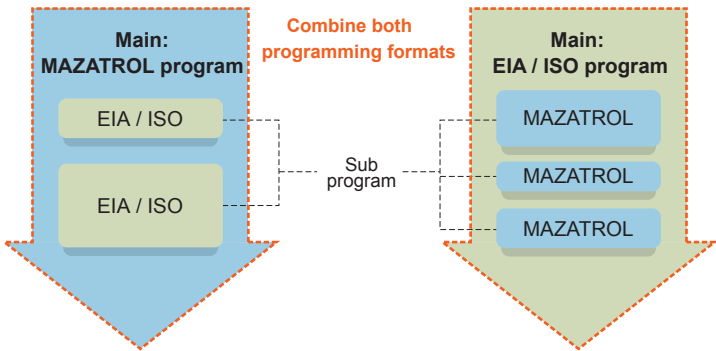
MAZATROL *SMOOTHC*

Mazak has been continuously developing the innovative MAZATROL conversationally programmed CNC system since introducing the MAZATROL T-1 in 1981. In addition to simplified programming, the MAZATROL provides easy set-up, fast completion of the first part and convenient machine maintenance.



Both MAZATROL conversational programs and EIA / ISO format programs can be used

Ability to use both conversational programming and EIA / ISO program format as sub – programs – standard equipment. Can be used in either method – MAZATROL main program with EIA / ISO sub – program or EIA / ISO main program with MAZATROL sub – program.



MAZATROL conversational programming

MAZATROL interactive programming uses conversational language and automatically determines cutting conditions, M codes, and G codes. Even a beginner operator can quickly make programs.

UNO.	MAT.	OD-MAX	ID-MIN	LENGTH	WORK FACE	RPM
0	ST IRN	200.	0.	300.	5.	3000.
UNO.	UNIT	FIN-Z				
1	FACING	0.1				
SNo.	TOOL	NOM.	No.PAT.	DEP-1	DEP-2/NUM.	DEP-3
R 1	GENERAL OUT	2.		4.		
F 2	GENERAL OUT	2.				
FIG		SPT-X	SPT-Z	FPT-X	FPT-Z	
1		200.	5.	0.	0.	
UNO.	UNIT	PART	CPT-X	CPT-Z	FIN-X	FIN-Z
2	BAR	OUT	200.	0.	0.3	0.1

Home screen

The home screen displays overall process status in an easy to understand manner.

Comprehensive status display on one screen

Machining

Displays axes in operation and load on motors

Programming

Displays the simulation time and machining time

Tool data

Displays status of tool layout

Setup

Displays status of workpiece coordinate setting

Maintenance

Overview of the status of items requiring maintenance



3D Machine Model

A 3D machine model is available to perform program interference checks with other CAD / CAM simulation software.



MAZATROL *SMOOTH-C*

MAZATROL SmoothC CNC - conversational programming and EIA / ISO format programs.



MAZATROL SmoothC Specifications

	MAZATROL	EIA
Number of controlled axes	Simultaneous 2~4 axes	Simultaneous 2~4 axes
Least input increment	0.0001 mm, 0.00001", 0.0001°	
High speed, high precision control	Shape error designation, Smooth corner control, Rapid traverse overlap	Shape error designation, Smooth corner control, Rapid traverse overlap
Interpolation	Positioning (Linear interpolation), Positioning (Independent interpolation), Linear interpolation, Circular interpolation, Cylindrical coordinate interpolation, Polar coordinate interpolation, Equal pitch threading, Re-threading*, Override threading*, Override variable threading*, Synchronized milling spindle tapping*	Positioning (Linear interpolation), Positioning (Independent interpolation), Linear interpolation, Circular interpolation, Spiral interpolation, Helical interpolation, Equal pitch threading, Variable pitch threading, Threading (C-axis interpolation type), Cylindrical coordinate interpolation*, Re-threading*, Override threading*, Override variable threading*, Synchronized milling spindle tapping*
Feedrate	Rapid traverse, Cutting feed, Cutting feed (per minute), Cutting feed (per revolution), Dwell (specified time, specified number of rotation), Rapid traverse override, Cutting feed override, G0 speed variable control, Feedrate clamp, Variable acceleration / deceleration control, Constant control for G0 tilting*	Rapid traverse, Cutting feed, Cutting feed (per minute), Cutting feed (per revolution), Inverse time feed, Dwell (specified time, specified number of rotation), Rapid traverse override, Cutting feed override, G0 speed variable control, Feedrate clamp, Time constant changing for G1, Variable acceleration / deceleration control, Constant control for G0 tilting*
Program registration	Max. number of programs : 960, Program storage : 2 MB, Program storage expansion : 8 MB*, Program storage expansion : 32 MB*	
Control display	Display : 10.4", Resolution : VGA	
Spindle functions	S code output, Spindle speed clamp, Spindle speed override, Spindle speed reaching detection, Multiple position orient, Constant surface speed, Spindle speed command with decimal digits, Synchronized spindle control, Max. speed control for spindle	
Tool functions	Tool offset pairs : 4000, T code output for tool number, Tool life monitoring (time), Tool life monitoring (number of machined workpieces)	Tool offset pairs : 4000, T code output for tool number, T code output for group number, Tool life monitoring (time), Tool life monitoring (number of machined workpieces)
Miscellaneous functions	M code output, Simultaneous output of multiple M codes	
Tool offset functions	Tool position offset, Tool length offset, Tool diameter / tool nose R offset, Tool nose shape offset, Tool wear offset, Fixed amount offset, Simple wear offset	Tool position offset, Tool length offset, Tool diameter / tool nose R offset, Tool wear offset, Fixed amount offset, Simple wear offset
Coordinate system	Machine coordinate system, Work coordinate system, Local coordinate system, MAZATROL coordinate system, Additional work coordinates (300 set)	
Machine functions	—	
Machine compensation	G0 / G1 independent backlash compensation, Pitch error compensation	
Protection functions	Emergency stop, Interlock, Stroke check before travelling, Barrier	
Automatic operation mode	Memory operation	Memory operation, Tape operation, MDI operation, EtherNet operation*
Automatic operation control	Optional stop, Dry run, Automatic handle control, MDI control, TPS, Restart, Single process, Machine lock	Optional block skip, Optional stop, Dry run, Automatic handle control, MDI control, TPS, Restart, Restart 2, Collation stop, Single process, Machine lock
Manual measuring functions	Tool-setting data teach, Tool length and tip teach, Touch sensor coordinates measurement, Workpiece offset measurement, Tool eye measurement	Tool-setting data teach, Tool length and tip teach, Tool offset teach, Touch sensor coordinates measurement, Workpiece offset measurement, Tool eye measurement
Automatic measuring functions	Workpiece measurement, Sensor calibration, Tool eye auto tool measurement, Tool breakage detection	
Interface	PROFIBUS-DP*, EtherNet I/P*, CC-Link*	
Card interface	SD card interface, USB	
EtherNet	10 M / 100 M / 1 Gbps	

*Option

Mazak FZ (FANUC 0i series)

The Mazak FZ CNC is based on the FANUC 0i series that is equipped with a variety of unique Mazak functions for increased ease of operation.



Mazak FZ Specifications

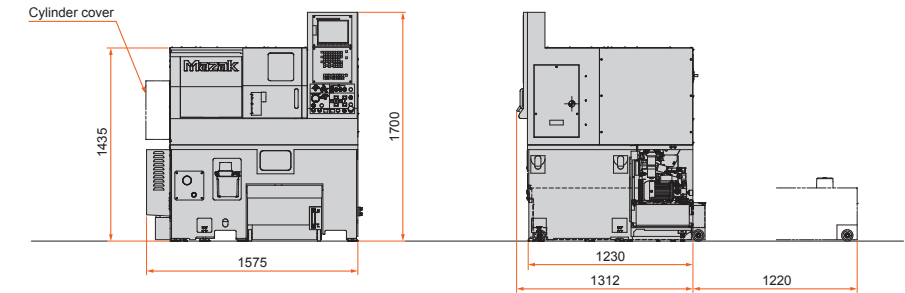
	Mazak FZ
Number of controlled axes	Max. 2 axes (simultaneous 2 axes)
Least input increment	0.0001 mm, 0.00001", 0.0001°
Max. programmable value	±99999.9999 mm, ±9999.99999", ±99999.9999"
High precision control	Nano interpolation, Absolute position detection
Interpolation	Positioning (Independent axes control, Linear interpolation), Linear interpolation, Circular interpolation, Cylindrical coordinate interpolation, Polar coordinate interpolation, Thread cutting (equal pitch, variable pitch)
Feed function	Rapid traverse, Cutting feed (per revolution, per minute), Feedrate clamp, Override (Rapid traverse, Cutting feed, External override, Override cancel), Automatic acceleration/deceleration feedrate, Constant tangential speed control, Dry run
Program storage capacity	400 registered program, 512 KB
Display	10.4" LCD
NC display languages	English, German, French, Italian, Spanish, Dutch, Swedish, Finnish, Danish, Portuguese, Turkish, Polish, Czech, Chinese simplified form, Chinese traditional form, Korean, Russian, Hungarian, Romanian, Bulgarian, Japanese, (one touch language switching)
Data Input / Output	CF card, USB
Interface	EtherNet (100 BASE-TX)
Spindle functions	S code output, Spindle revolution control (RPM clamp, high speed indication / speed change detection, Rotary speed display), Spindle override (0 - 150 %), Constant surface speed, Spindle orient*
Tool functions	T code output (8-digit binary data), Spare tool exchange
Tool compensation	Tool position compensation, Tool tip R compensation, Automatic tool compensation, Tool tip shape compensation, Tool wear compensation
Tool offset pairs	Max. 64
Miscellaneous functions	M code output (Max.8-digit), Second miscellaneous functions (Max. 8-digit output), High speed MSTB interface
Coordinate system control	Machine coordinate system (Machine coordinate system, Machine coordinate system shift), Work coordinate system (Work coordinate system, Work coordinate system shift), Rapid traverse, Cutting feed, Handle feed, Zero-point return, Manual control (machine lock)
Manual operation	Manual spindle control (spindle start, stop, reverse, jogging)
Automatic operation	Memory operation, MDI operation, NC reset, Single block, Feed hold, Optional block skip, Optional stop, Machine lock, Feed override, Spindle control, Dry run, Manual handle control, Data server*
Background functions	During automatic operation (Programming, Data input / output)
Machine compensation	Backlash compensation, Thermal displacement compensation
Protection functions	Emergency stop, Barrier (chuck barrier, tail barrier), Interlock (cutting start, axis interlock), Alarm
Measuring functions	Manual measurement (Tool set measurement, Z-offset measurement), Automatic measurement (Work measurement, Z-offset measurement, Tool tip point measurement)

*Option

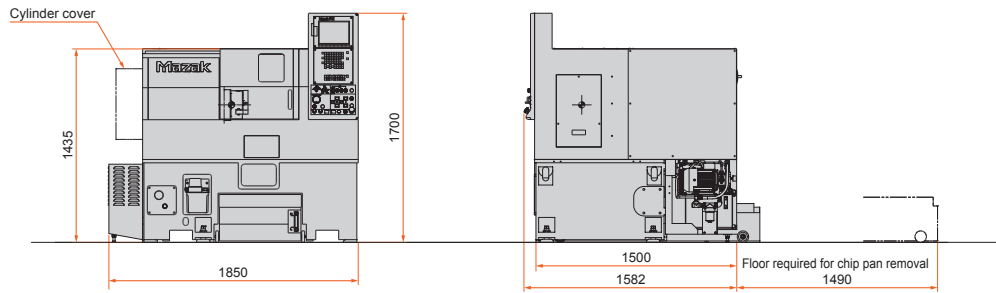
Machine Dimensions

Unit :mm

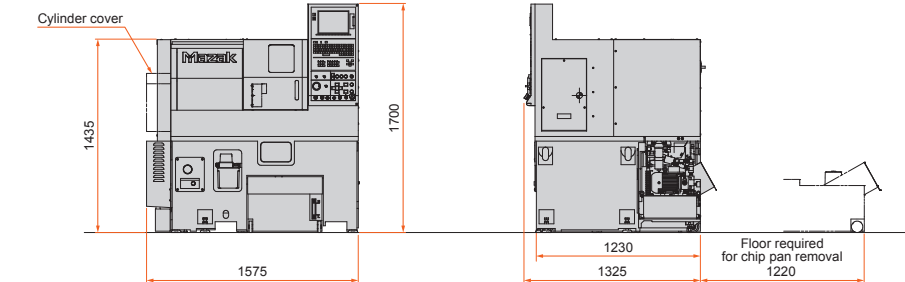
QT-PRIMOS 50 SG , 100 SG (Mazak FZ)



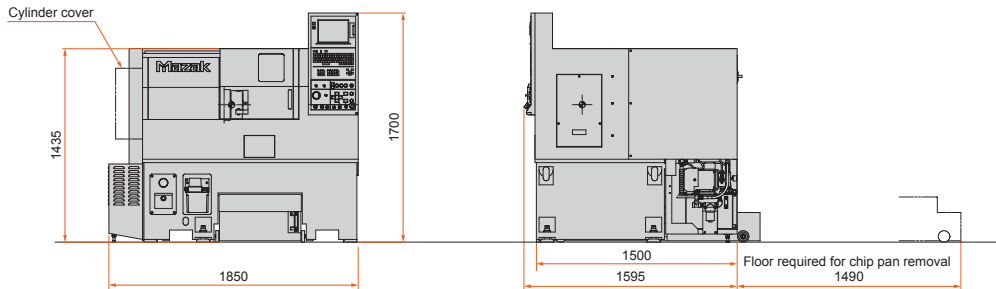
QT- PRIMOS 150 SG (Mazak FZ)



QT-PRIMOS 50 SG,100 SG (MAZATROL SmoothC)



QT-PRIMOS 150 SG (MAZATROL SmoothC)



Standard Machine Specifications

		50 SG	100 SG	150 SG
Capacity	Universal	200U	200U	250U
	Max. swing	Φ444 mm	Φ444 mm	Φ580 mm
	Max. machining diameter	Φ180 mm	Φ180 mm	Φ250 mm
	Machining diameter	Φ180 mm	Φ180 mm	Φ250 mm
	Max. machining length	204 mm	200 mm	264 mm
	Bar work capacity	Φ32 mm	Φ36 mm	Φ51 mm
Travel	X-axis	110 mm	110 mm	140 mm
	Z-axis	240 mm	240 mm	305 mm
Spindle	Chuck size	5"	6"	8"
	Spindle speed	5000 rpm	5000 rpm	4000 rpm
	Number of spindle speed ranges	No step	No step	No step
	Spindle nose	Φ140 mm	Φ140 mm	Φ170 mm
	Spindle bore	Φ45 mm	Φ45 mm	Φ61 mm
Turret	Turret type	8 position drum turret	8 position drum turret	8 position drum turret
	Number of tools	8	8	8
	Tool shank height	20 mm	20 mm	25 mm
	Boring bar shank diameter	Φ20 mm / Φ25 mm	Φ20 mm / Φ25 mm	Φ32 mm
	Turret indexing time (one position)	0.2 sec	0.2 sec	0.2 sec
Feedrate	Rapid traverse rate: X-axis	30000 mm/min	30000 mm/min	30000 mm/min
	Rapid traverse rate: Z-axis	30000 mm/min	30000 mm/min	30000 mm/min
Tailstock (Option)	Positioning	Manual	Manual	Manual
	Tailstock center	MT-No.3 (dead centre)	MT-No.3 (dead centre)	MT-No.4 (dead centre)
Motors	Spindle motor (40 % ED / Cont. rating)	7.5 / 5.5 kW (10 / 7.5 HP)	9 / 7.5 kW (12 / 10 HP)	11 / 11 kW (15 / 15 HP)
	Coolant pump motor	0.25 kW [0.52kW (option)]	0.25 kW [0.52kW (option)]	0.25 kW [0.52 / 1.1kW (option)]
Power requirement (cont. rating)	Mazak FZ	13.58 kVA	17.15 kVA	23.29 kVA
	MAZATROL SmoothC	11 kVA	14 kVA	20 kVA
Coolant	Tank capacity	130 L	130 L	160 L
Machine size	Mazak FZ	Machine height	1700 mm	1700 mm
		Floor space requirement	1575 mm x 1230 mm	1575 mm x 1230 mm
		Weight	2000 kg	2600 kg
	MAZATROL SmoothC	Machine height	1700 mm	1700 mm
		Floor space requirement	1575 mm x 1230 mm	1575 mm x 1230 mm
		Weight	2050 kg	2600 kg
Sound	Equivalent continuous sound pressure level at operator position (dependant on equipment options)		Less than 80 db (A)	

Above specifications vary by market.