HQR SERIES

Mazak

HQR

SERIES

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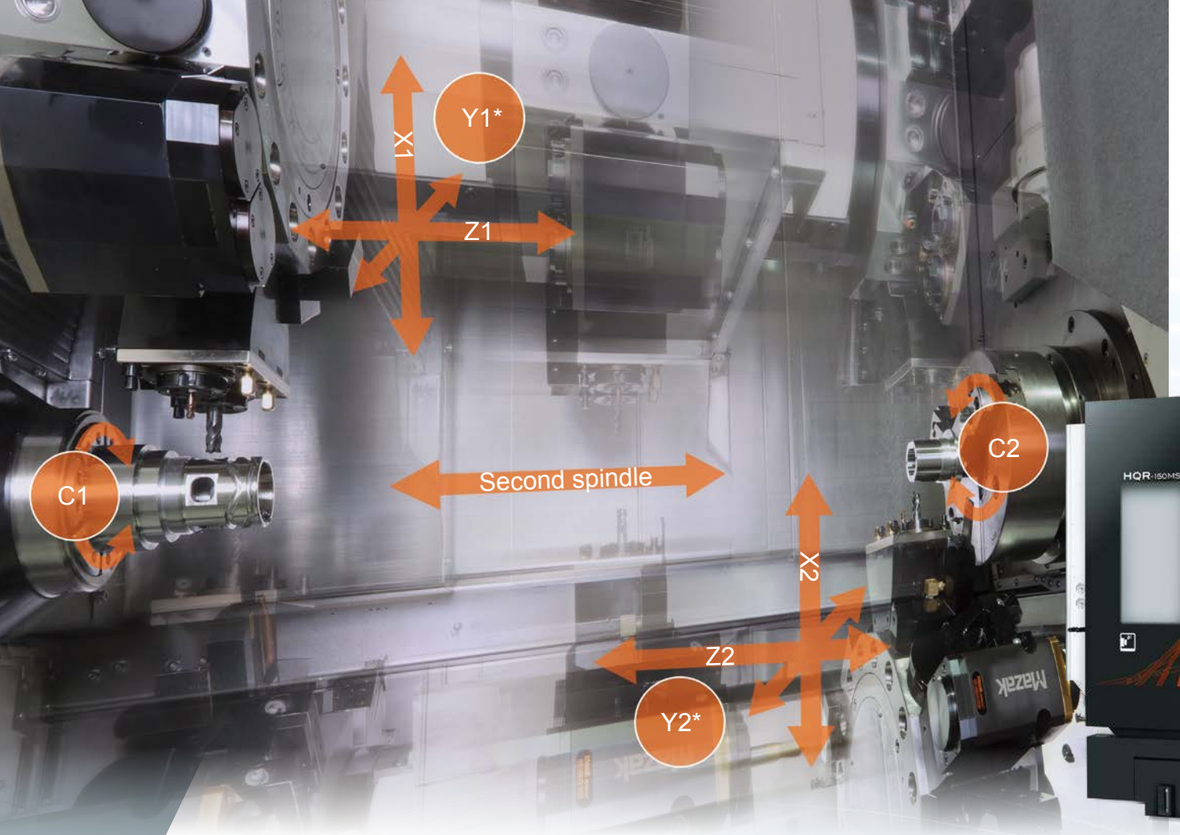
EA

HQR SERIES 20.09.0 G 99J1A5518E

High efficiency 2 turret / 2 spindle CNC turning centers

HQR SERIES



*Y1 and Y2 are only on 100MSY, 150MSY, 200MY, 200MSY, 250MY and 250MSY

HQR-150MSY
(Shown with optional equipment)

HQR-200MSY (850U)
(Shown with optional equipment)

High Productivity in a Small Floor Space

- **2 turret / 2 spindle machine construction for reduced cycle time**
- **High efficiency integral spindle / motors in both left and right headstocks perform powerful turning and high accuracy C-axis indexing in 0.0001° increments**
- **In addition to the standard 12 position drum turret and 16 position drum turret are optionally available**
- **High accuracy milling thanks to the rotary tool spindle on both turrets and long Y-axis stroke (MY, MSY)**
- **A variety of automation equipment such as bar feeders, workpiece unloader and robot are optionally available**

	Main Spindle Max. spindle speed Output [30 min. rating] Chuck size	Second Spindle Max. spindle speed Output [30 min. rating] Chuck size	Tailstock	Turret	Rotary tool spindle Max. spindle speed Output	Universal
100MSY	6000 rpm 11 kW(15HP) 6”	6000 rpm 11 kW(15HP) 6”		12D (VDI)	6000 rpm 5.5 kW(7.5HP) (10 min. rating)	600U
					6000 rpm 11 kW(15HP) (3 min. rating)	
150MSY	5000 rpm 15 kW(20HP) 6”				10000 rpm 5.5 kW(7.5HP) (40% ED)	
200MS	5000 rpm 22 kW(30HP) 8”	5000 rpm 22 kW(30HP) 8”		12D (VDI)	6000 rpm 5.5 kW(7.5HP) (10 min. rating)	850U
200MSY				16D (VDI)	6000 rpm 11 kW(15HP) (3 min. rating)	1300U
250MS	4000 rpm 26 kW(35HP) 10”	5000 rpm 22 kW(30HP) 8”		12D (VDI)	6000 rpm 5.5 kW(7.5HP) (10 min. rating)	850U
250MSY		4000 rpm 26 kW(35HP) 10”		16D (VDI)	6000 rpm 11 kW(15HP) (3 min. rating)	1300U
200MY	5000 rpm 22 kW(30HP) 8”	MT No.4 Built-in center		12D (VDI)	6000 rpm 5.5 kW(7.5HP) (10 min. rating)	700U
250MY	4000 rpm 26 kW(35HP) 10”	MT No.5 Dead center		16D (VDI)	6000 rpm 11 kW(15HP) (3 min. rating)	

Standard Option

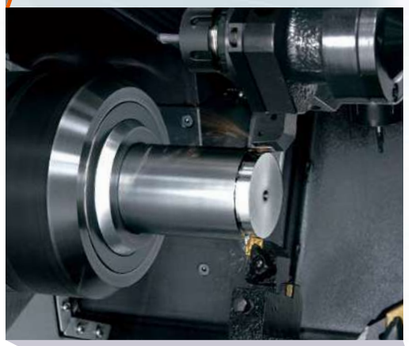
Concept

2 turret / 2 spindle machine design for reduced cycle times

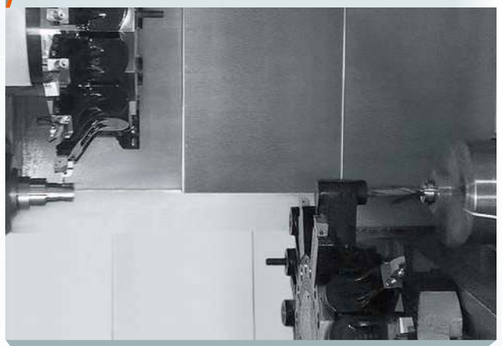
The HQR series can perform high-efficiency cutting such as simultaneous 1st and 2nd operations and balanced cutting by utilizing the upper and lower turrets.

By synchronized machining of both turrets, balance cutting that minimizes workpiece displacement can be performed. Additionally, simultaneous turning reduces cycle time.

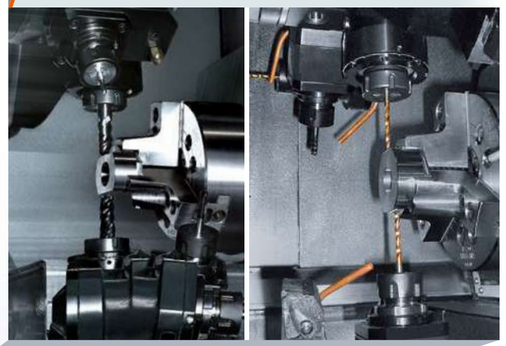
Balanced turning on main spindle



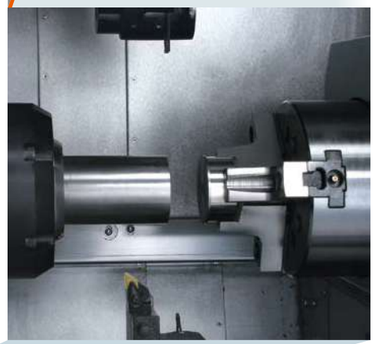
Simultaneous machining of two workpieces



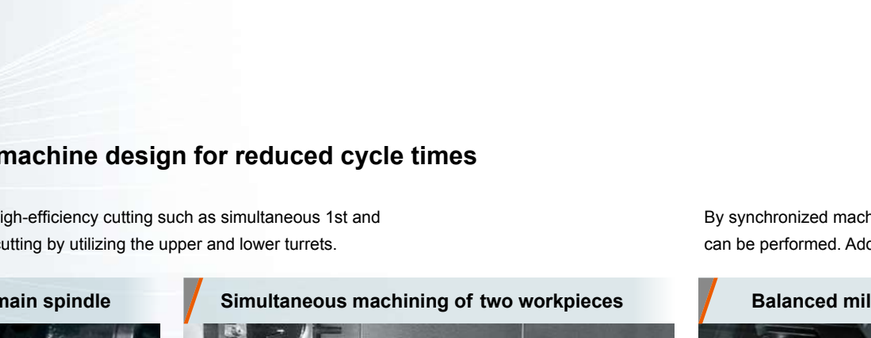
Balanced milling on second spindle



Cut-off



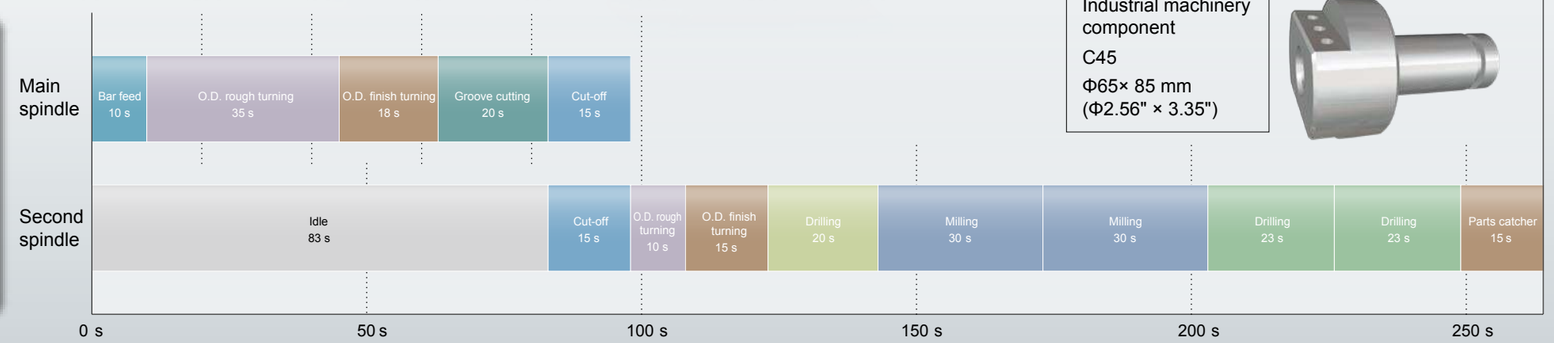
HQR-150MSY
with bar feeder
and unloader



Cycle time reduced by **47%**

Cycle time
141 sec

1 turret
2 spindle
CNC turning
center
with bar feeder
and auto parts
catcher



Cycle time **264 sec**

Industrial machinery component
C45
Φ65× 85 mm
(Φ2.56" × 3.35")

Sample workpieces

- Workpiece : Pulley
- Material : Aluminum
- Cutting time : 5 min

- Workpiece : Sleeve
- Material : Carbon steel
- Cutting time : 4.5 min

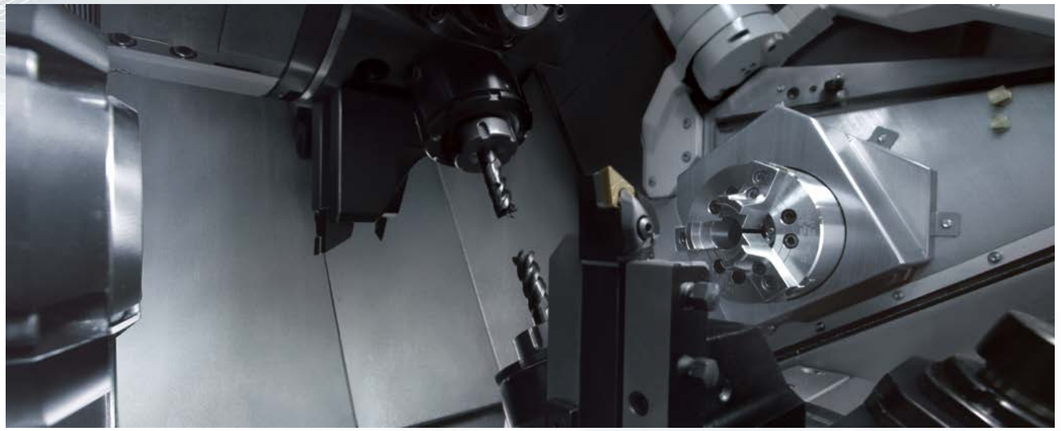
- Workpiece : Machine component
- Material : Carbon steel
- Cutting time : 10 min

- Workpiece : Piston housing
- Material : Carbon steel
- Cutting time : 3.9 min

- Workpiece : Shaft
- Material : Carbon steel
- Cutting time : 4 min

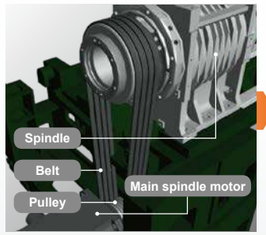
Higher Productivity

High efficiency integral spindle / motors in both headstocks



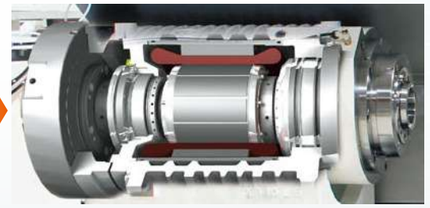
Thanks to its design, vibration is minimized during high-speed operation to ensure exceptional surface finishes and maximum tool life. Since no transmission with belts, pulleys or gears is used, the higher efficiency of the integral spindle / motor delivers more power to the tool tip to be used for cutting. The spindle C1-axis and C2-axis can be indexed by 0.0001° increments and can also perform contouring.

Conventional belt drive

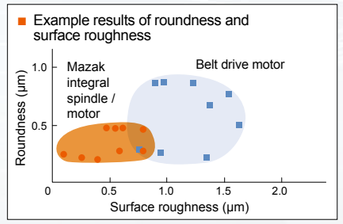


Vibration increases with faster speed

HQR integral spindle / motor



Minimum vibration produced by integral spindle / motor



Bar work capacity (MS, MSY)

Since both the main spindle and second spindle have large spindle bores, bar material can be efficiently machined.

Machine(s)	Main spindle	Second spindle
HQR-100MSY	Φ52 mm (Φ2.05")	Φ52 mm (Φ2.05")
HQR-150MSY	Φ65 mm (Φ2.56")	Φ52 mm (Φ2.05")
HQR-200MS, 200MSY	Φ65 mm (Φ2.56")	Φ65 mm (Φ2.56")
HQR-250MS, 250MSY	Φ80 mm (Φ3.15")	Φ65 mm (Φ2.56")
HQR-250MS, 250MSY OPTION	Φ80 mm (Φ3.15")	Φ80 mm* (Φ3.15")

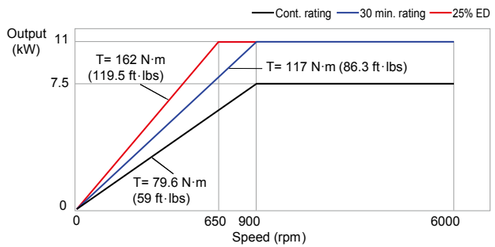
* Spindle speed is 4000 rpm.

Spindle output / torque diagram

6000 rpm 11 kW (15 HP) spindle

HQR-100MSY main spindle / second spindle
HQR-150MSY second spindle

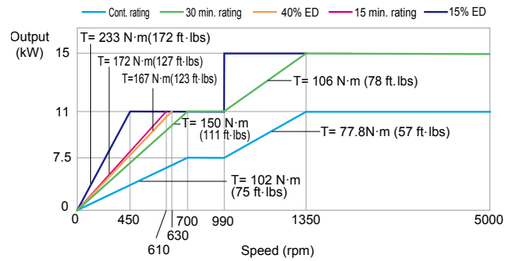
Output (30 min. rating / cont. rating)	11 kW / 7.5 kW
Torque (25% ED)	162 N·m (119.5 ft·lbs)
Spindle bore	Φ61 mm (Φ2.4")



5000 rpm 15 kW (20 HP) spindle

HQR-150MSY main spindle

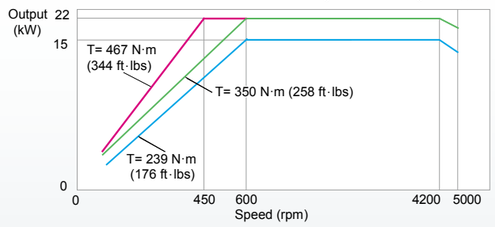
Output (30 min. rating / cont. rating)	15 kW / 11 kW
Torque (15% ED)	233 N·m (171.9 ft·lbs)
Spindle bore	Φ76 mm (Φ2.99")



5000 rpm 22 kW (30 HP) spindle

HQR-200MS, 200MSY main spindle / second spindle
HQR-200MY main spindle

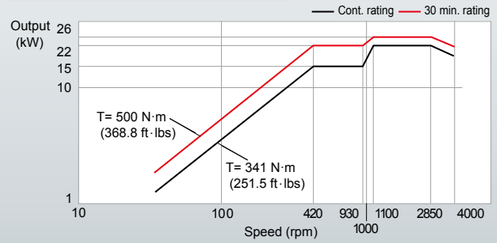
Output (30 min. rating / cont. rating)	22 kW / 15 kW
Torque (25% ED)	467 N·m (344 ft·lbs)
Spindle bore	Φ76 mm (Φ2.99")



4000 rpm 26 kW (35 HP) spindle

HQR-250MS, 250MY, 250MSY main spindle
HQR-250MS, 250MSY second spindle (Φ91 mm (Φ3.58") bore : OPTION)

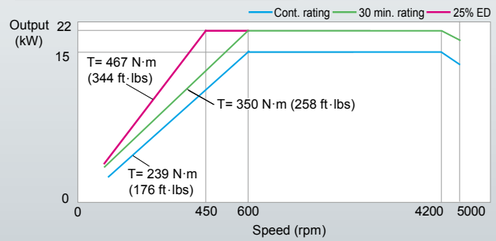
Output (30 min. rating / cont. rating)	26 kW / 22 kW
Torque (30 min. rating)	500 N·m (368.8 ft·lbs)
Spindle bore	Φ91 mm (Φ3.58")



5000 rpm 22 kW (30 HP) spindle

HQR-250MS, 250MSY second spindle

Output (25% ED / cont. rating)	22 kW / 15 kW
Torque (25% ED)	467 N·m (344 ft·lbs)
Spindle bore	Φ76 mm (Φ2.99")



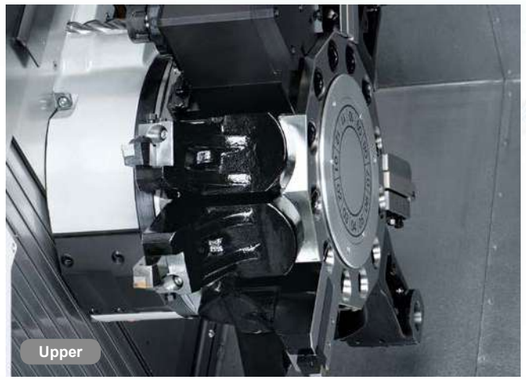
Higher Productivity

High-performance non-lift turret

12 position drum turret

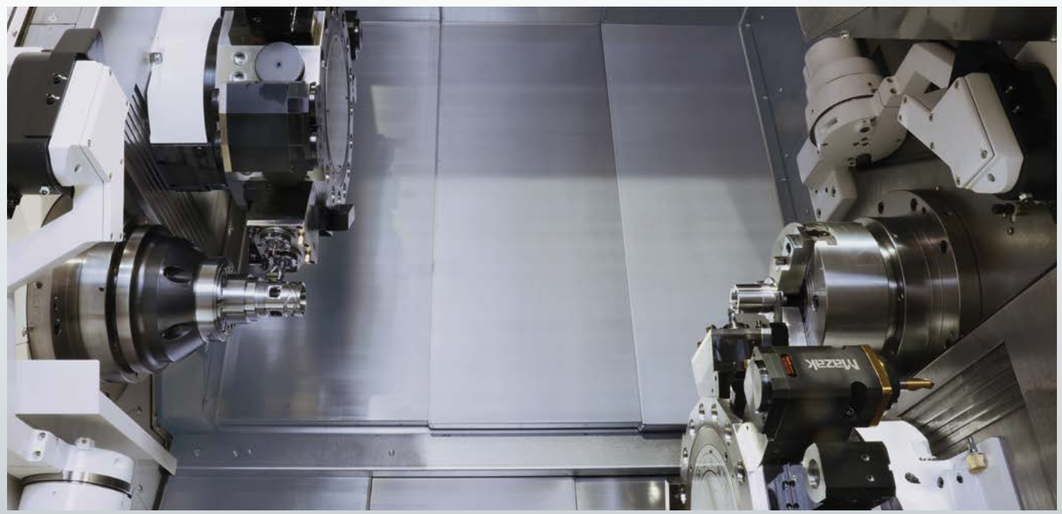
Both the upper and lower 12 position drum turrets can mount either turning or milling tools on each of the 12 positions for convenient setup.

Turning tool shank	□20 mm (3/4") [100MSY, 150MSY] □25 mm (1") [200, 250 series]
Boring bar shank diameter	Φ32 mm (Φ1 - 1/4") [100MSY, 150MSY] Φ40 mm (Φ1 - 1/2") [200, 250 series]



16 position drum turret (200,250 series) OPTION

Turning tool shank	□20 mm (3/4")
Boring bar shank diameter	Φ32 mm (Φ1 - 1/4")



Rotary tool spindle

Milling spindle provides performance comparable to a small machining center from powerful face milling to high speed drilling.

Milling capacity

12 position drum turret

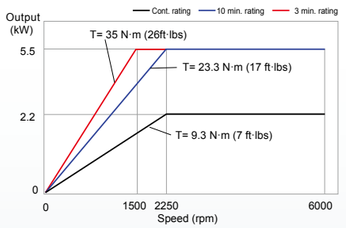
100, 150 series	Drill Φ16 mm (Φ0.63") Endmill Φ16 mm (Φ0.63") Tap M16 (5/8 UNC) × 2.0
200, 250 series	Drill Φ20 mm (Φ0.79") Endmill Φ20 mm (Φ0.79") Tap M20 (3/4 UNC) × 2.5

16 position drum turret

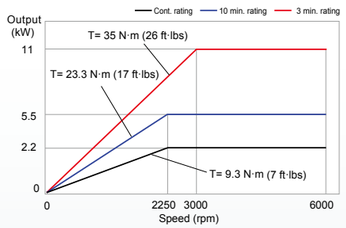
200, 250 series	Drill Φ16 mm (Φ0.63") Endmill Φ16 mm (Φ0.63") Tap M16 (5/8 UNC) × 2.0

Rotary tool spindle output / torque diagram

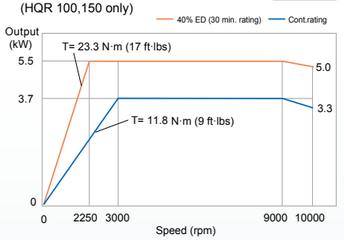
6000 rpm, 5.5 kW (7.5 HP) spindle



6000 rpm, 11 kW (15 HP) spindle OPTION



10000 rpm, 5.5 kW (7.5 HP) spindle (HQR 100,150 only) OPTION



Quick-Change Mill Holder (100,150 series)

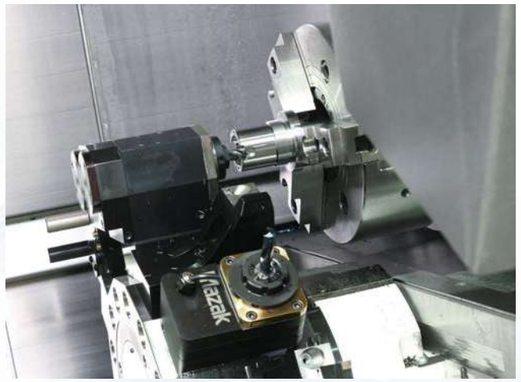
The HQR series use tool holder equipped with Quick Change system for higher machining capability.
A wide variety of tools can be mounted by using adapter.
Tools can be mounted / removed easily by using one-hand wrench.

One hand wrench can easily tight by spring

Higher Productivity

Upper / lower turret Y-axis (MY, MSY)

The Y-axis stroke(upper turret :100 mm [±50 mm] (4" [±2"]) lower turret :100 mm [±50 mm] (4" [±2"])) makes it possible to perform a wide variety of machining.

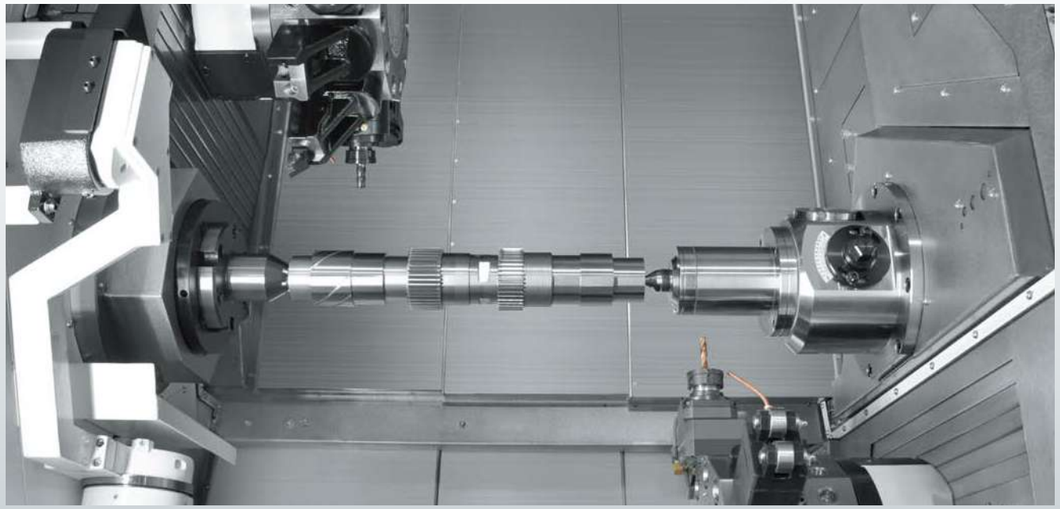


Tailstock (MY)

The HQR-200MY and 250MY are equipped with a tailstock. Servo motor controlled tailstock movement and thrust allow automation of shaft workpiece machining.

Thrust	7 kN
Tailstock center	No.4 Built-in center (standard) No.5 Dead center (option)

Example : face driver on main spindle for the complete machining of a shaft workpiece



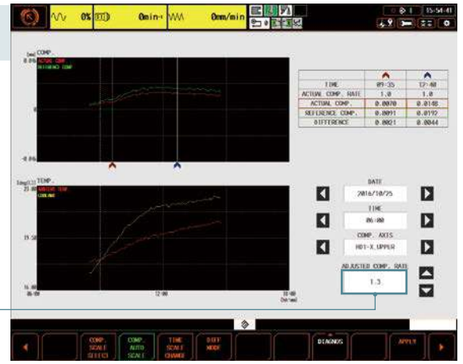
HQR-250MY shown

Higher Accuracy

Heat Displacement Control - THERMAL SHIELD

The THERMAL SHIELD is an automatic compensation for room temperature changes, which 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. Changes in the room temperature and compensation data are shown visually.

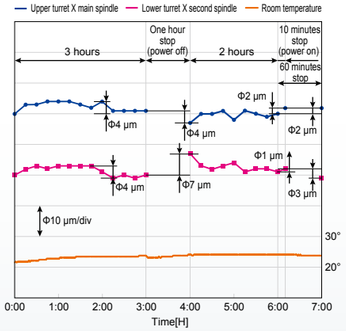
Temperature and compensation is displayed on the MAZATROL SmoothG screen. The operator can adjust compensation by looking at the data.



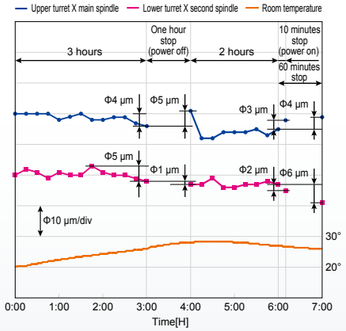
Heat displacement of HQR-150MSY

Chuck size 6", max. machining diameter Φ300 mm (Φ11.81"), distance between chuck jaws 620 mm (24.41")

Constant room temperature



Room temperature change (8°C)



Above results for reference only.

Roundness

HQR-150MSY test results

The inspection is conducted according to ISO-230 on a recommended foundation with room temperature controlled to 22°C±1°C (71.6°F±1.8°F) after machine has reached operation temperature.

Material	Brass JIS C3604
Spindle speed	3000 rpm
Machining conditions	Feedrate 0.03 mm/rev (0.0011811"/rev) D.O.C 0.02 mm (0.000787402")
Tool	Diamond tool (DA2200) Nose R 0.4 mm (0.015748")

Results 0.26 μm (0.0000102")
(Main spindle)

Results 0.30 μm (0.0000118")
(Second spindle)

Factory Automation

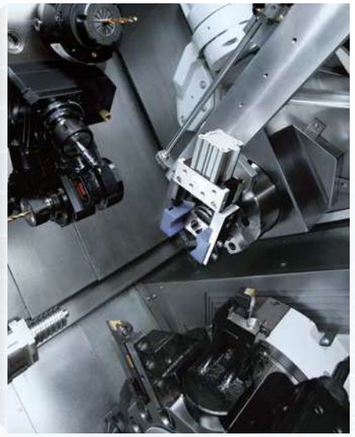
A wide variety of optional equipment is available for the HQR series

Bar feeder and workpiece unloader

Effective operation from bar material to finished workpiece.
The unloader hand is designed to prevent any marring of the finished workpiece surface.

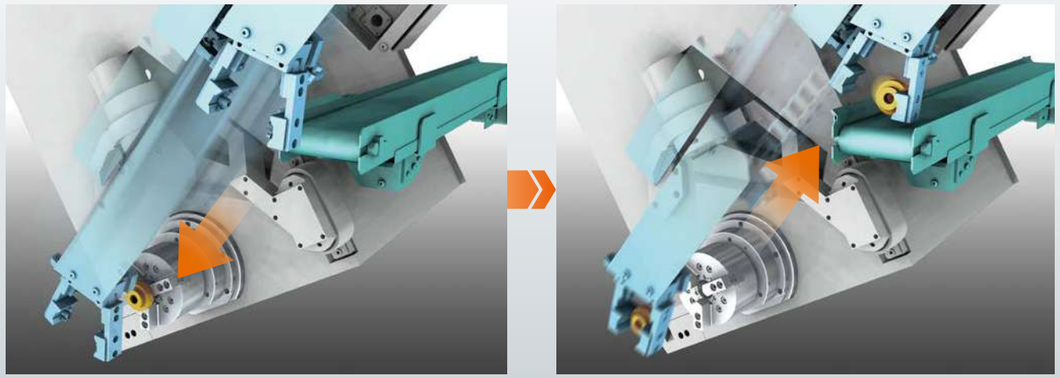
HQR-100MSY

Workpiece unloader hand



Workpiece unloader

The work unloader removes the workpiece from the chuck and transfers it outside of the machine without damaging the machined surfaces. (workpiece unloader not available for the HQR-200MY and 250MY)



Automatic operation system ROBOT LOADER 100 (200, 250 series)

By utilizing the work loader robot and pallet, automatic operation for chuck workpieces can be performed over extended periods of time to realize high productivity.

HQR-200MSY

Automation for chuck workpieces

- Easy setup by MAZATROL SmoothG
- Minimum floor space requirements
- Large pallet storage
- Safe operation

Standard hand	Double hands with 3-jaws for chuck workpieces (D3)
Max. workpiece weight*	10 kg (22 lbs) × 2
Max. diameter	Φ20 mm ~ Φ150 mm (Φ0.79" ~ Φ5.91")
Workpiece length	20 mm ~ 100 mm (0.79" ~ 3.94")

*1 When grips outer diameter

Loading material

Unloading finished workpiece

Transferring workpiece to pallet

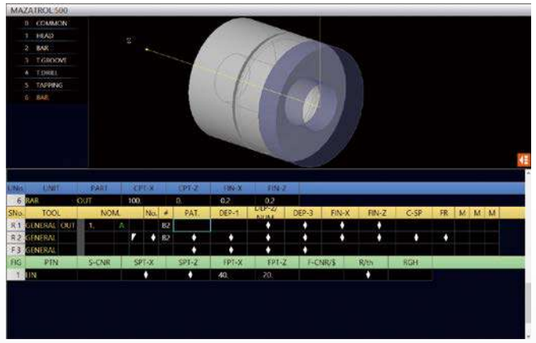
MAZATROL CNC System

5 process home screens

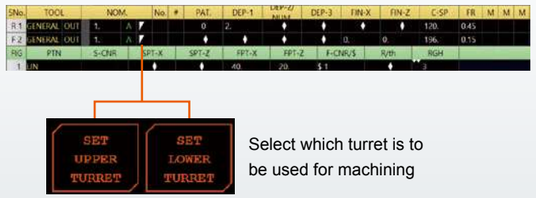
Programming, confirmation, editing and tool data registration

MAZATROL SmoothG CNC system - conversational programming for machining with upper and lower turrets

By simply selecting requirements for machining - such as workpiece material and surface finish - from the conversational menu and inputting data - cutting conditions and the tool path are automatically made. By combining these units, the entire machining program can be easily made with the MAZATROL SmoothG. Different from standard EIA / ISO programs, the feedrate for each axis movement does not have to be determined and input - as a result, the number of program lines is considerably reduced.



Both upper and lower turrets are easily operated by conversational programs - to use the lower turret, all that is required to input is the "lower turret mark : ◪" for the respective tool in the program. Additionally, machining programs are easily made for separate machining of both spindles by the upper and lower turrets, simultaneous machining and balanced machining of both turrets thanks to the MAZATROL SmoothG conversational programming.



Select which turret is to be used for machining

Convenient balance cut programming

The balance cut program can be conveniently made by just selecting balance cut on the turning program unit.

Unsurpassed ease of operation with touch screen

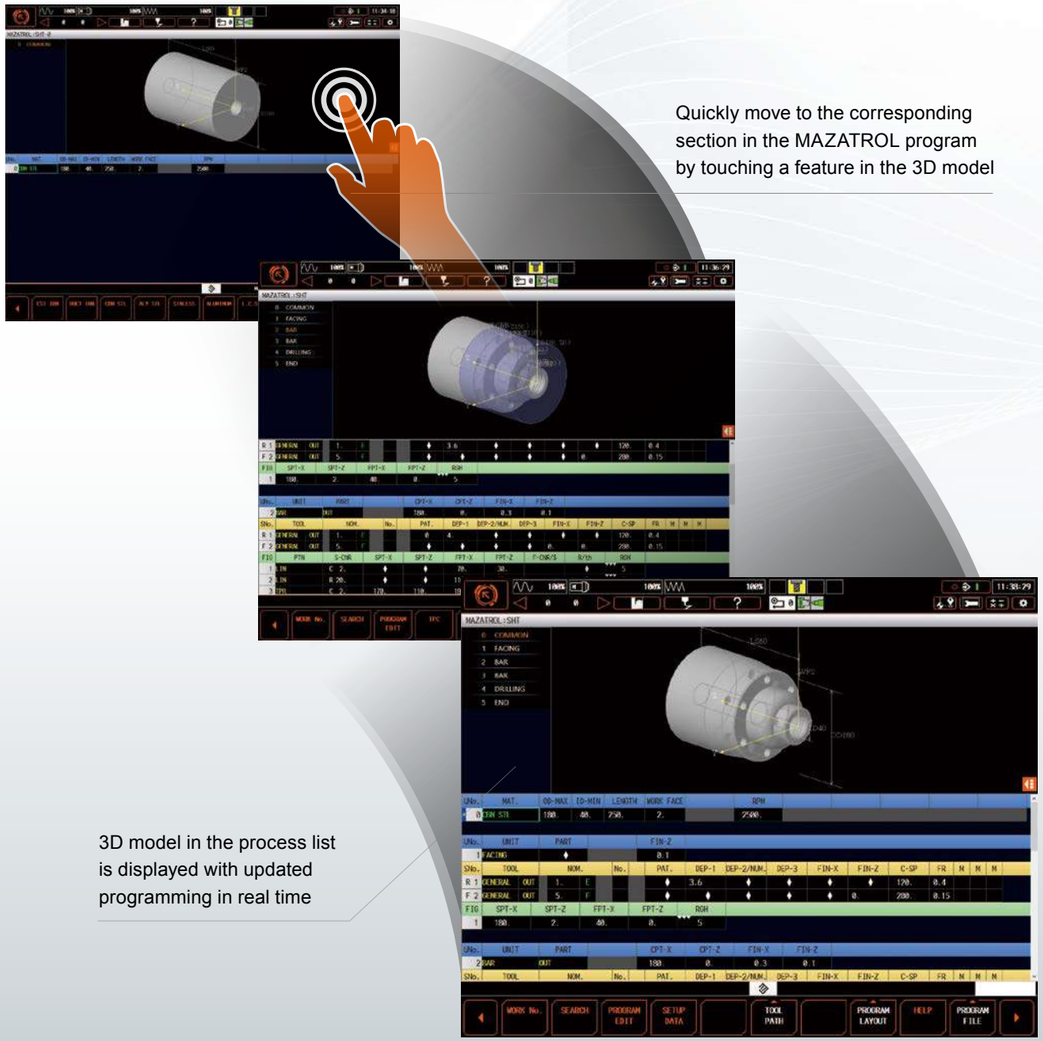
MAZATROL SMOOTH G

Ease of Programming

Programming screen links tool path, workpiece shape and programming to reduce programming time

QUICK MAZATROL

[Reduced time for conversational programming]
MAZATROL program, unit list and 3D workpiece shape are linked to each other. After defining a machining unit in a MAZATROL program, the 3D shape is immediately displayed to easily and quickly check for any programming error.

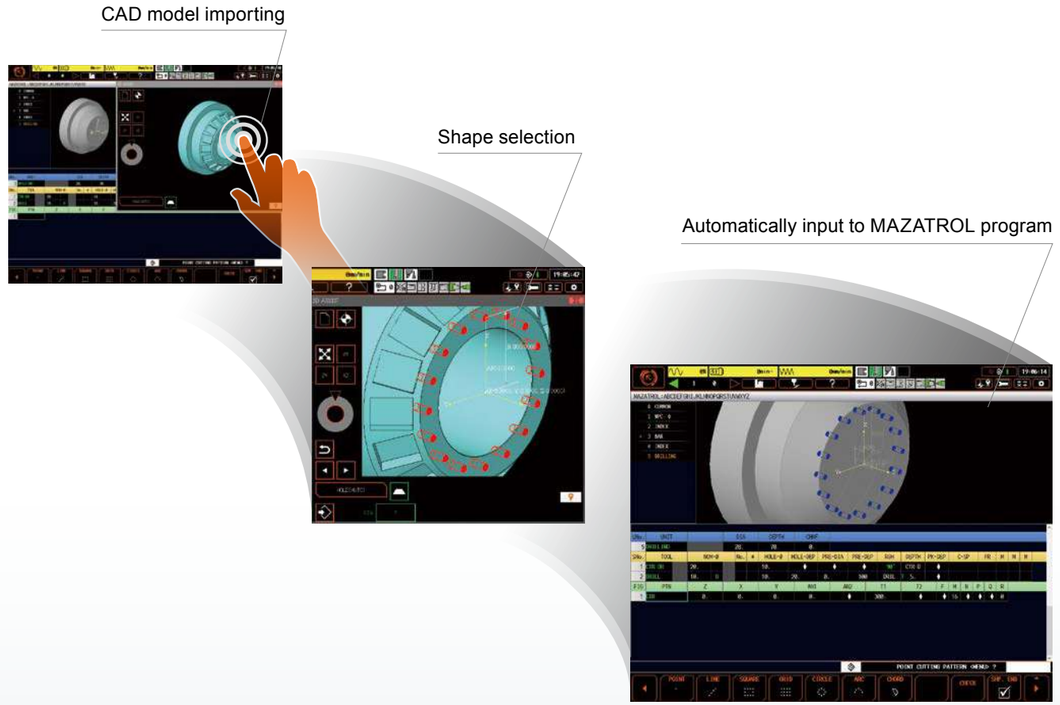


Quickly move to the corresponding section in the MAZATROL program by touching a feature in the 3D model

3D model in the process list is displayed with updated programming in real time

3D ASSIST

[Making a program directly from 3D CAD data]
Workpiece and coordinates data can be imported from 3D CAD data to a MAZATROL program. No coordinate value inputs are required. Can reduce input errors and time for program checking.



QUICK EIA

[EIA program visualization]
Program, process list and 3D tool path display are linked to each other. Visible search on touch screen can reduce the time for program checking.

Selecting tool path by touching the screen

Moving to the corresponding EIA program line

MAZATROL SmoothG Specifications

	MAZATROL	EIA
Number of controlled axes	Simultaneous 2~4 axes	
Least input increment	0.0001 mm, 0.00001 inch, 0.0001 deg	
High speed, high precision control	Shape compensation, Smooth corner control, Rapid traverse overlap	
Interpolation	Positioning (interpolation), Positioning (non-interpolation), Linear interpolation, Circular interpolation, Cylindrical interpolation, Polar coordinate interpolation, Constant lead threading, Re-threading*, Thread start point compensation*, Thread cut-speed override*, Synchronous tapping*	Positioning (interpolation), Positioning (non-interpolation), Linear interpolation, Circular interpolation, Spiral interpolation, Helical interpolation, Constant lead threading, Variable lead threading, Threading (C-axis interpolation type), Cylindrical interpolation*, NURBS interpolation*, Polar coordinate interpolation*, Re-threading*, Thread start point compensation*, Thread cut-speed override*, Synchronous tapping*
Feedrate	Rapid traverse, Cutting feed, Cutting feed (per minute), Cutting feed (per revolution), Dwell (time / rotation), Rapid traverse override, Cutting feed override, G0 speed variable control, Feedrate limitation, Variable acceleration control, G0 slope constant*	Rapid traverse, Cutting feed, Cutting feed (per minute), Cutting feed (per revolution), Inverse time feed, Dwell (time / rotation), Rapid traverse override, Cutting feed override, G0 speed variable control, Feedrate limitation,Time constant changing for G1, Variable acceleration control, G0 slope constant*
Program registration	Number of programs : 256 (Standard) / 960 (Max.) Program memory : 2 MB, Program memory expansion : 8 MB*, Program memory expansion : 32 MB*	
Control display	Display : 19" touch panel, Resolution : SXGA	
Spindle function	S code output, Spindle speed limitation, Spindle speed override, Spindle speed reaching detection, Multiple position orient, Constant surface speed, Spindle speed command with decimal digits, Synchronized spindle control, Spindle speed range setting	
Tool functions	Number of tool offset : 4000, T code output for tool number, Tool life monitoring (time), Tool life monitoring (number of machined workpieces), Tool life monitoring (wear)	Number of tool offset : 4000, T code output for tool number, T code output for group number, Tool life monitoring (time), Tool life monitoring (number of machined workpieces), Tool life monitoring (wear)
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	-	Polygonal machining*, Hobbing*
Machine compensation	Backlash compensation, Pitch error compensation	
Protection functions	Emergency stop, Interlock, Pre-move stroke check, Barrier, SAFETY SHIELD (manual mode), SAFETY SHIELD (automatic mode)*, VOICE ADVISER	
Automatic operation mode	Memory operation	Memory operation, Tape operation, MDI operation, EtherNet operation*
Automatic operation control	Optional stop, Dry run, Manual handle interruption, MDI interruption, TPS, Restart, Single process, Machine lock	Optional block skip, Optional stop, Dry run, Manual handle interruption, MDI interruption, TPS, Restart, Restart2, Collation stop, Machine lock
Manual measuring function	Tool-setting data teach, Tool length teach, Touch sensor coordinates measurement, Workpiece offset measurement, Tool eye measurement	Tool-setting data teach, Tool length teach, Tool offset teach, Touch sensor coordinate measurement, Workpiece offset measurement, Tool eye measurement
Automatic measuring function	Workpiece measurement, Sensor calibration, Tool eye auto tool measurement, Tool breakage detection	
Interface	PROFIBUS-DP*, EtherNet I/P*, CC-Link*	
Memory	SD card interface, USB	
EtherNet	10 M / 100 M / 1 Gbps	

*Option

3D machine model

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

Standard Machine Specifications

		HQR-100MSY	HQR-150MSY
Capacity (upper / lower turret)	Max. swing	Φ320 mm / Φ270 mm (Φ12.6" / Φ10.63")	
	Max. machining diameter	Φ300 mm / Φ172 mm (Φ11.625" / Φ6.77")	
	Distance between chuck jaw faces (both spindles)	620 mm (24.375")	
	Bar work capacity*1	Φ52 mm (Φ2.05")	Φ65 mm (Φ2.56")
Travel (upper / lower turret)	X-axis	175 mm / 111 mm (6.875" / 4.3125")	
	Y-axis	100 mm (±50 mm) / 100 mm (±50 mm) (4" [±2"] / 4" [±2"])	
	Z-axis	520 mm / 580 mm (20.375" / 22.75")	
Main spindle	Spindle speed*1	6000 rpm	5000 rpm
	Spindle nose	A2-5	A2-6
	Spindle bore	Φ61 mm (Φ2.4")	Φ76 mm (Φ2.99")
	Rapid traverse rate : C-axis	555 rpm	
Second spindle	Spindle speed*1	6000 rpm	
	Spindle nose	A2-5	
	Spindle bore	Φ61 mm (Φ2.4")	
	Second headstock stroke (W-axis)	625 mm (24.5")	
	Second headstock positioning speed (W-axis)	30000 mm/min (1181 IPM)	
	Rapid traverse rate : C-axis	555 rpm	
Upper / lower turret	Turret type	12-position drum turrret (VDI)	
	Number of tools	12 tools	
	Turning tool shank	□20 mm (3/4")	
	Boring bar shank diameter	Φ32 mm (Φ1-1/4")	
	Turret indexing time	0.2 s / 1 step	
Rotary tool spindle	Spindle speed	6000 rpm	
	Milling capacity	Drill : Φ16 mm (Φ0.63"), Endmill : 16 mm (0.63"), Tap : M16 (5/8 UNC) × 2.0	
Feedrate (upper / lower turret)	Rapid traverse rate : X-axis	30000 mm/min / 24000 mm/min (1181 IPM / 945 IPM)	
	Rapid traverse rate : Y-axis	26000 mm/min / 20000 mm/min (1024 IPM / 787 IPM)	
	Rapid traverse rate : Z-axis	40000 mm/min / 40000 mm/min (1575 IPM / 1575 IPM)	
Motors	Main spindle (30 min. rating / cont. rating)	11 kW (15 HP) / 7.5 kW (10 HP)	15 kW (20 HP) / 11 kW (15 HP)
	Second spindle (30 min. rating / cont. rating)	11 kW (15 HP) / 7.5 kW (10 HP)	
	Rotary tool spindle (10 min. rating)	5.5 kW (7.5 HP)	
Power requirement	Required power capacity (cont. rating)	34.2 kVA	39.2 kVA
	Air supply	0.5 MPa (72.5 PSI), 500 L/min (17.7 ft^3/min)	
Coolant tank capacity	Tank capacity	260 L (68.69 gal)	
Machine size	Height	2427.3 mm (95.6")	
	Floor space requirement*2	2862 mm × 2316 mm (112.68" × 91.2")	
	Machine weight	9160 kg (20194 lbs)	9220 kg (20326 lbs)

*1 Depends on chuck specifications
*2 Operation panel and chip conveyor not included

Standard Machine Specifications

		HQR-200MS		HQR-200MY	HQR-200MSY	
		850U	1300U	700U	850U	1300U
Capacity (upper / lower turret)	Max. swing	Φ370 mm / Φ320 mm (Φ14.6" / Φ12.6")				
	Max. machining diameter	Φ344 mm / Φ212 mm (Φ13.5" / Φ8.35")				
	Distance between chuck jaw faces (both spindles)	860 mm (33.9")	1325 mm (52.2")	860 mm (33.9")		1325 mm (52.2")
	Bar work capacity*1	Φ65 mm (Φ2.6")				
Travel (upper / lower turret)	X-axis	207 mm / 141 mm (8.2" / 5.5625")				
	Y-axis	-		100 mm (±50 mm) / 100 mm (±50 mm) (4" [±2] / 4" [±2"])		
	Z-axis	760 mm / 815 mm (29.875" / 32.125")	1225 mm / 1280 mm (48.25" / 50.5")	760 mm / 815 mm (29.875" / 32.125")		1225 mm / 1280 mm (48.25" / 50.5")
Main spindle	Spindle speed*1	5000 rpm				
	Spindle nose	A2-6				
	Spindle bore	Φ76 mm (Φ2.99")				
	Rapid traverse rate : C-axis	555 rpm				
Second spindle	Spindle speed*1	5000 rpm		-	5000 rpm	
	Spindle nose	A2-6				
	Spindle bore	Φ76 mm (Φ2.99")				
	Second headstock stroke (W-axis)	865 mm (34.075")	1330 mm (52.375")	-	865 mm (34.075")	1330 mm (52.375")
	Second headstock positioning speed (W-axis)	30000 mm/min (1181 IPM)		-	30000 mm/min (1181 IPM)	
	Rapid traverse rate : C-axis	555 rpm		-	555 rpm	
Tailstock	Travel	-		705 mm	-	
	Tailstock center	-		No.4 built-in center	-	
Upper / lower turret	Turret type	12-position drum turret (VDI)				
	Number of tools	12 tools				
	Turning tool shank	□25 mm (1")				
	Boring bar shank diameter	Φ40 mm (Φ1-1/2")				
	Turret indexing time	0.2 s / 1 step				
Rotary tool spindle	Spindle speed	6000 rpm				
	Milling capacity	Drill : Φ20 mm (Φ0.79"), Endmill : 20 mm (0.79"), Tap : M20 (3/4 UNC) × 2.5				
Feedrate (upper / lower turret)	Rapid traverse rate : X-axis	30000 mm/min / 24000 mm/min (1181 IPM / 945 IPM)				
	Rapid traverse rate : Y-axis	-		26000 mm/min / 20000 mm/min (1024 IPM / 787 IPM)		
	Rapid traverse rate : Z-axis	36000 mm/min / 36000 mm/min (1417 IPM / 1417 IPM)				
Motors	Main spindle (30 min. rating / cont. rating)	22 kW (30 HP) / 15 kW (20 HP)				
	Second spindle (30 min. rating / cont. rating)	22 kW (30 HP) / 15 kW (20 HP)		-	22 kW (30 HP) / 15 kW (20 HP)	
	Rotary tool spindle (10 min. rating)	5.5 kW (7.5 HP)				
Power requirement	Required power capacity (cont. rating)	58.3 kVA		37.9 kVA	59.4 kVA	
	Air supply	0.5 MPa (72.5 PSI), 500 L/min (17.7 ft³ / min)				
Coolant tank capacity	Tank capacity	310 L (82 gal)	400 L (106 gal)	310 L (82 gal)		400 L (106 gal)
Machine size	Height	2497.3 mm(98.32")				
	Floor space requirement*2	3510 mm × 2641 mm (138.19" × 103.98")	4670 mm × 2701 mm (183.9" × 106.34")	3510 mm × 2641 mm (138.19" × 103.98")		4670 mm × 2701 mm (183.9" × 106.34")
	Machine weight	12450 kg (27447 lbs)	14480 kg (31922 lbs)	12650 kg (27888 lbs)	12850 kg (28329 lbs)	14980 kg (33025 lbs)

*1 Depends on chuck specifications
*2 Operation panel and chip conveyor not included

Standard Machine Specifications

		HQR-250MS		HQR-250MY	HQR-250MSY	
		850U	1300U	700U	850U	1300U
Capacity (upper / lower turret)	Max. swing	Φ370 mm / Φ320 mm (Φ14.6" / Φ12.6")				
	Max. machining diameter	Φ344 mm / Φ212 mm (Φ13.5" / Φ8.35")				
	Distance between chuck jaw faces (both spindles)	860 mm (33.86")	1325 mm (52.17")	860 mm (33.86")		1325 mm (52.17")
	Bar work capacity*1 (main spindle / second spindle)	Φ80 mm (Φ3.15") / Φ65 mm (Φ2.6")				
Travel (upper / lower turret)	X-axis	207 mm / 141 mm (8.2" / 5.5625")				
	Y-axis	-		100 mm (±50 mm) / 100 mm (±50 mm) (4" [±2"] / 4" [±2"])		
	Z-axis	760 mm / 815 mm (29.875" / 32.125")	1225 mm / 1280 mm (48.25" / 50.5")	760 mm / 815 mm (29.875" / 32.125")		1225 mm / 1280 mm (48.25" / 50.5")
Main spindle	Spindle speed*1	4000 rpm				
	Spindle nose	A2-8				
	Spindle bore	Φ91 mm (Φ3.58")				
	Rapid traverse rate : C-axis	555 rpm				
Second spindle	Spindle speed*1	5000 rpm		-	5000 rpm	
	Spindle nose	A2-6				
	Spindle bore	Φ76 mm (Φ2.99")				
	Second headstock stroke (W-axis)	865 mm (34.075")	1330 mm (52.375")	-	865 mm (34.075")	1330 mm (52.375")
	Second headstock positioning speed (W-axis)	30000 mm/min (1181 IPM)		-	30000 mm/min (1181 IPM)	
	Rapid traverse rate : C-axis	555 rpm		-	555 rpm	
Tailstock	Travel	-		705 mm	-	
	Tailstock center	-		No.4 built-in center	-	
Upper / lower turret	Turret type	12-position drum turret (VDI)				
	Number of tools	12 tools				
	Turning tool shank	□25 mm (1")				
	Boring bar shank diameter	Φ40 mm (Φ1-1/2")				
	Turret indexing time	0.2 s / 1 step				
Rotary tool spindle	Spindle speed	6000 rpm				
	Milling capacity	Drill : Φ20 mm (Φ0.79"), Endmill : 20 mm (0.79"), Tap : M20 (3/4 UNC) × 2.5				
Feedrate (upper / lower turret)	Rapid traverse rate : X-axis	30000 mm/min / 24000 mm/min (1181 IPM / 945 IPM)				
	Rapid traverse rate : Y-axis	-		26000 mm/min / 20000 mm/min (1024 IPM / 787 IPM)		
	Rapid traverse rate : Z-axis	36000 mm/min / 36000 mm/min (1417 IPM / 1417 IPM)				
Motors	Main spindle (30 min. rating / cont. rating)	26 kW (35 HP) / 22 kW (30 HP)				
	Second spindle (30 min. rating / cont. rating)	22 kW (30 HP) / 15 kW (20 HP)		-	22 kW (30 HP) / 15 kW (20 HP)	
	Rotary tool spindle (10 min. rating)	5.5 kW (7.5 HP)				
Power requirement	Required power capacity (cont. rating)	68.5 kVA		48.6 kVA	69.6 kVA	
	Air supply	0.5 MPa (72.5 PSI), 500 L/min (17.7 ft³ / min)				
Coolant tank capacity	Tank capacity	310 L (82 gal)	400 L (106 gal)	310 L (82 gal)		400 L (106 gal)
Machine size	Height	2497.3 mm(98.32")				
	Floor space requirement*2	3510 mm × 2641 mm (138.19" × 103.98")	4670 mm × 2701 mm (183.86" × 106.34")	3510 mm × 2641 mm (138.19" × 103.98")		4670 mm × 2701 mm (183.86" × 106.34")
	Machine weight	12850 kg (28329 lbs)	14880 kg (32804 lbs)	13050 kg (28770 lbs)	13250 kg (29211 lbs)	15380 kg (33907 lbs)

*1 Depends on chuck specifications
*2 Operation panel and chip conveyor not included

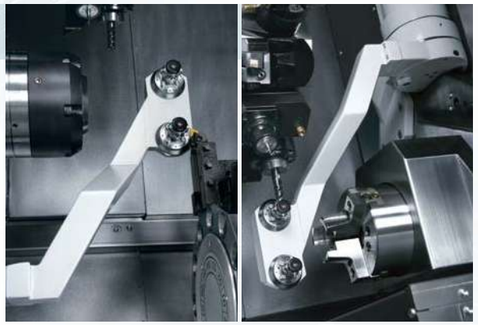
Optional Equipment

Automatic opening / closing front door

The automatic opening / closing front door operates in 3 speed steps. If an operator inadvertently places a hand in the opening, operation will automatically stop when the door contacts his hand.

Tool eye STANDARD

The tool eye can be programmed for automatic tool measurement and compensation as well as inspection for tool breakage. In addition, since tool setup is done by simply bringing the tool tip into contact with the tool eye, tool setup time is considerably reduced.

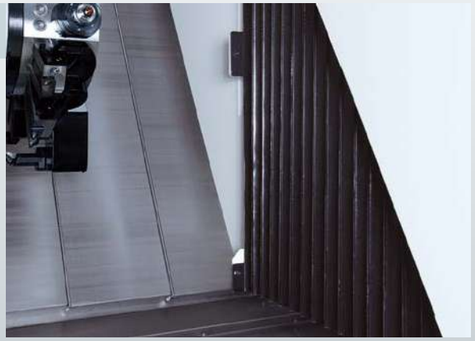


Auto parts catcher

Auto parts catcher automatically moves workpieces to outside of the machine. By using a bar feeder and work conveyor, automatic operation can be performed.

Area separator (1300U)

Thanks to the area separator, workpiece loading / unloading can be performed even during machining on the other side.



Standard and Optional Equipment

● : Standard ○ : Option - : N/A

		100MSY	150MSY	200MS (850U)	200MS (1300U)	200MY (700U)	200MSY (850U)	200MSY (1300U)
Machine	12 position drum turret	●	●	●	●	●	●	●
	16 position drum turret (VDI)	-	-	○	○	○	○	○
	Rotary-tool spindle speed 6000 rpm / 5.5 kw	●	●	●	●	●	●	●
	Rotary-tool spindle speed 6000 rpm / 11 kw	○	○	○	○	○	○	○
	Rotary-tool spindle speed 10000 rpm / 5.5 kw	○	○	-	-	-	-	-
	Absolute position detection	●	●	●	●	●	●	●
	Work light	●	●	●	●	●	●	●
	Double foot-pedal switch	○	○	○	○	○	○	○
Chuck	Through-hole chuck (B-206)	○	○	-	-	-	-	-
	Through-hole chuck (BB-206)	○	○	-	-	-	-	-
	Through-hole chuck (B-208)	-	-	○	○	○	○	○
	Through-hole chuck (BB-208)	-	-	○	○	○	○	○
	Collet chuck (SAD-50)	○	-	-	-	-	-	-
	Collet chuck (CB65-ND-A)	-	○	○	○	○	○	○
	Second spindle through-hole chuck (B-206)	○	○	-	-	-	-	-
	Second spindle through-hole chuck (BB-206)	○	○	-	-	-	-	-
	Second spindle through-hole chuck (B-208)	-	-	○	○	-	○	○
	Second spindle through-hole chuck (BB-208)	-	-	○	○	-	○	○
Safety equipment	Front door interlock	●	●	●	●	●	●	●
	Hydraulic pressure interlock	●	●	●	●	●	●	●
	Overload detection	○	○	○	○	○	○	○
Factory automation	Automatic chuck jaw open / close	●	●	●	●	●	●	●
	Chuck open / close confirmation	●	●	●	●	●	●	●
	Coolant temperature control system	○	○	○	○	○	○	○
	Machining end buzzer	○	○	○	○	○	○	○
	Spindle orient	○	○	○	○	○	○	○
	Second spindle C-axis contouring (0.0001°)	○	○	○	○	-	○	○
	Calendar-type automatic power ON / OFF + warm-up operation	●	●	●	●	●	●	●
	Tool eye (main / second spindle)	●	●	●	●	●*1	●	●
	Workpiece measurement (upper turret)	○	○	○	○	○	○	○
	High / low chuck pressure (main / second spindle)	○	○	○	○	○*1	○	○
	Main spindle chuck jaws air blast	○	○	○	○	○	○	○
	Second spindle chuck jaws air blast	●	●	●	●	-	●	●
	Turret air blast (upper / lower turret)	○	○	○	○	○	○	○
	Automatic front door open / close	○	○	○	○	○	○	○
	Area separator	-	-	-	○	-	-	○
	Mist collector	○	○	○	○	○	○	○
	Preparation for mist collector	○	○	○	○	○	○	○
	Status light (3 colors)	○	○	○	○	○	○	○
	Status light (1 color)	○	○	○	○	○	○	○
	Tail center attachment	○	○	○	○	○	○	○
	Bar feeder interface	○	○	○	○	○	○	○
	Filler tube	○	○	○	○	○	○	○
	Workpiece unloader + workpiece conveyor	○	○	○	○	○	○	○
	Robot interface	○	○	○	○	○	○	○
	Robot system	-	-	○	○	○	○	○
	Scale feedback (X1, X2)	○	○	○	○	○	○	○
	Scale feedback (Z1)	○	○	○	○	○	○	○
Coolant / chip disposal	Splash guard	●	●	●	●	●	●	●
	Coolant tank (260 L (68.69 gal))	●	●	-	-	-	-	-
	Coolant tank (310 L (82 gal))	-	-	●	-	●	●	-
	Coolant tank (400 L (106 gal))	-	-	-	●	-	-	●
	Coolant system	●	●	●	●	●	●	●
	Powerful coolant 1.1 kW	○	○	○	○	○	○	○
	High pressure coolant 1.5 MPa (218 PSI)	○	○	○	○	○	○	○
	Additional coolant (main / second spindle)	○	○	○	○	○*1	○	○
	Chip conveyor (side / rear discharge)	○	○	○	○*2	○	○	○*2
	Chip bucket (fixed / rotary type)	○	○	○	○	○	○	○
Others	Adjustment tools	●	●	●	●	●	●	●
	One set of manuals	●	●	●	●	●	●	●
	Foundation kit	●	●	●	●	●	●	●

*1 Not on second spindle side
*2 Side discharge chip conveyor only for 1300U

Standard and Optional Equipment

● : Standard ○ : Option - : N/A

		250MS (850U)	250MS (1300U)	250MY (700U)	250MSY (850U)	250MSY (1300U)
Machine	12 position drum turret	●	●	●	●	●
	16 position drum turret (VDI)	○	○	○	○	○
	Rotary-tool spindle speed 6000 rpm / 5.5 kw	●	●	●	●	●
	Rotary-tool spindle speed 6000 rpm / 11 kw	○	○	○	○	○
	4000 rpm second spindle bore Φ91 mm (Φ3.58")	○	○	-	○	○
	Absolute position detection	●	●	●	●	●
	Work light	●	●	●	●	●
	Double foot-pedal switch	○	○	○	○	○
Chuck	Through-hole chuck (BB-210)	○	○	○	○	○
	Second spindle through-hole chuck (B-208)	○	○	-	○	○
	Second spindle through-hole chuck (BB-208)	○	○	-	○	○
	Second spindle through-hole chuck (BB-210)	○	○	-	○	○
Safety equipment	Front door interlock	●	●	●	●	●
	Hydraulic pressure interlock	●	●	●	●	●
	Overload detection	○	○	○	○	○
Factory automation	Automatic chuck jaw open / close	●	●	●	●	●
	Chuck open / close confirmation	●	●	●	●	●
	Coolant temperature control system	○	○	○	○	○
	Machining end buzzer	○	○	○	○	○
	Spindle orient	○	○	○	○	○
	Second spindle C-axis contouring (0.0001°)	○	○	-	○	○
	Calendar-type automatic power ON / OFF + warm-up operation	●	●	●	●	●
	Tool eye (main / second spindle)	●	●	●*1	●	●
	Workpiece measurement (upper turret)	○	○	○	○	○
	High / low chuck pressure (main / second spindle)	○	○	○*1	○	○
	Main spindle chuck jaws air blast	○	○	○	○	○
	Second spindle chuck jaws air blast	●	●	-	●	●
	Turret air blast (upper / lower turret)	○	○	○	○	○
	Automatic front door open / close	○	○	○	○	○
	Area separator	-	○	-	-	○
	Mist collector	○	○	○	○	○
	Preparation for mist collector	○	○	○	○	○
	Status light (3 colors)	○	○	○	○	○
	Status light (1 color)	○	○	○	○	○
	Tail center attachment	○	○	○	○	○
	Bar feeder interface	○	○	○	○	○
	Filler tube	○	○	○	○	○
	Workpiece unloader + workpiece conveyor	○	○	-	○	○
	Robot interface	○	○	○	○	○
	Robot system	○	○	○	○	○
	Scale feedback (X1, X2)	○	○	○	○	○
	Scale feedback (Z1)	○	○	○	○	○
Coolant / chip disposal	Splash guard	●	●	●	●	●
	Coolant tank (251 L (66 gal))	-	-	-	-	-
	Coolant tank (310 L (82 gal))	●	-	●	●	-
	Coolant tank (400 L (106 gal))	-	●	-	-	●
	Coolant system	●	●	●	●	●
	Powerful coolant 1.1 kW	○	○	○	○	○
	High pressure coolant 1.5 MPa (218 PSI)	○	○	○	○	○
	Additional coolant (main / second spindle)	○	○	○*1	○	○
	Chip conveyor (side / rear discharge)	○	○*2	○	○	○*2
	Chip bucket (fixed / rotary type)	○	○	○	○	○
Others	Adjustment tools	●	●	●	●	●
	One set of manuals	●	●	●	●	●
	Foundation kit	●	●	●	●	●

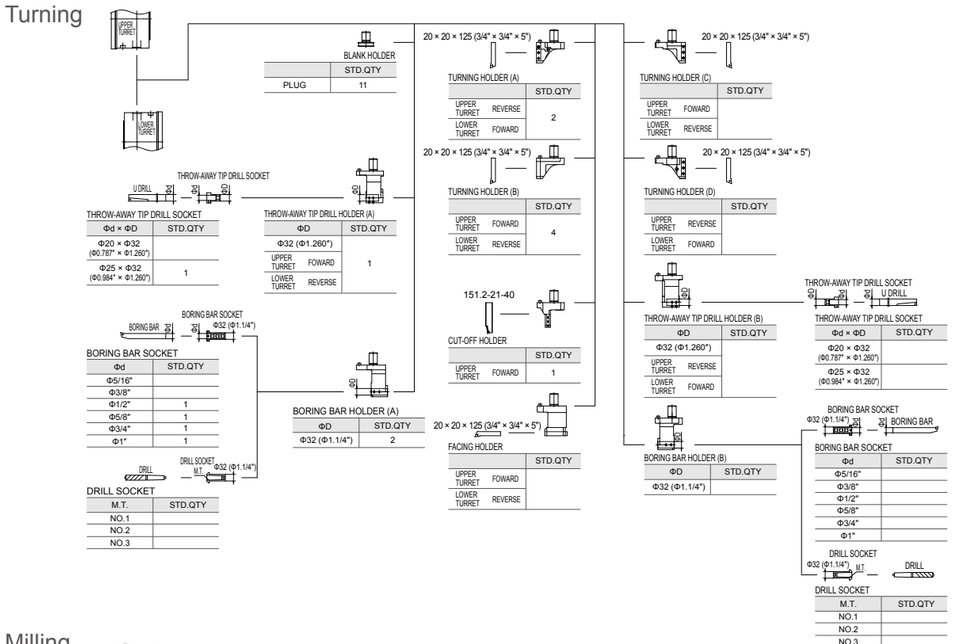
*1 Not on second spindle side
*2 Side discharge chip conveyor only for 1300U

Tooling System

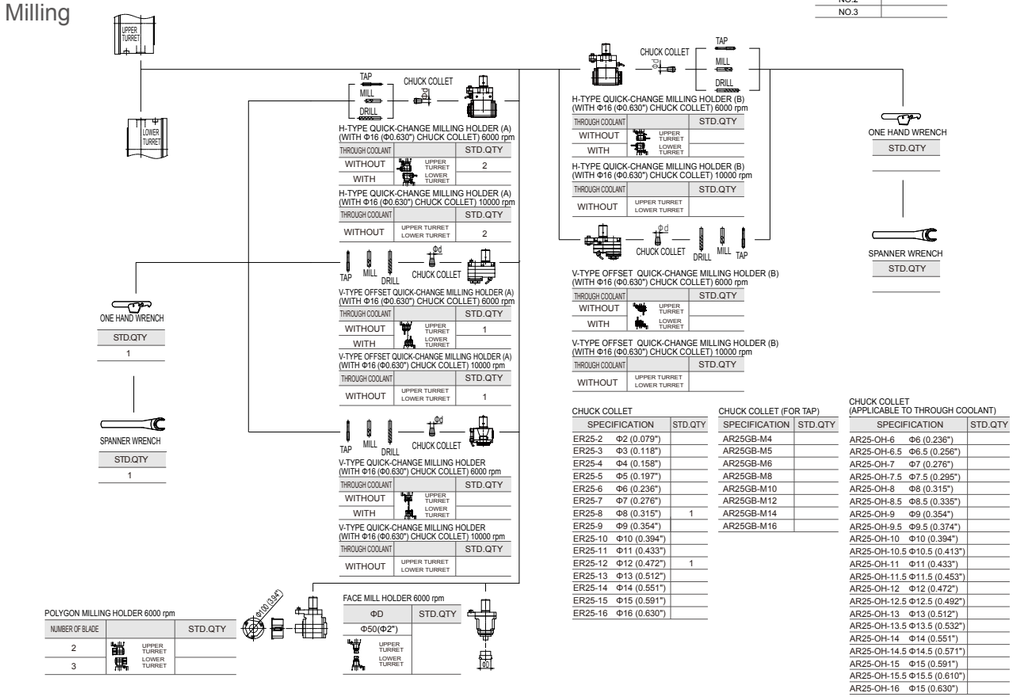
Unit : mm (inch)

HQR-100, 150 series 12 position upper / lower turret

Turning



Milling



CHUCK COLLET

SPECIFICATION	STD.QTY
ER25-2 Φ2 (0.079")	
ER25-3 Φ3 (0.118")	
ER25-4 Φ4 (0.158")	
ER25-5 Φ5 (0.197")	
ER25-6 Φ6 (0.236")	
ER25-7 Φ7 (0.276")	
ER25-8 Φ8 (0.315")	1
ER25-9 Φ9 (0.354")	
ER25-10 Φ10 (0.394")	
ER25-11 Φ11 (0.433")	
ER25-12 Φ12 (0.472")	1
ER25-13 Φ13 (0.512")	
ER25-14 Φ14 (0.551")	
ER25-15 Φ15 (0.591")	
ER25-16 Φ16 (0.630")	

CHUCK COLLET (FOR TAP)

SPECIFICATION	STD.QTY
AR25GB-M4	
AR25GB-M5	
AR25GB-M6	
AR25GB-M8	
AR25GB-M10	
AR25GB-M12	
AR25GB-M14	
AR25GB-M16	

CHUCK COLLET (APPLICABLE TO THROUGH COOLANT)

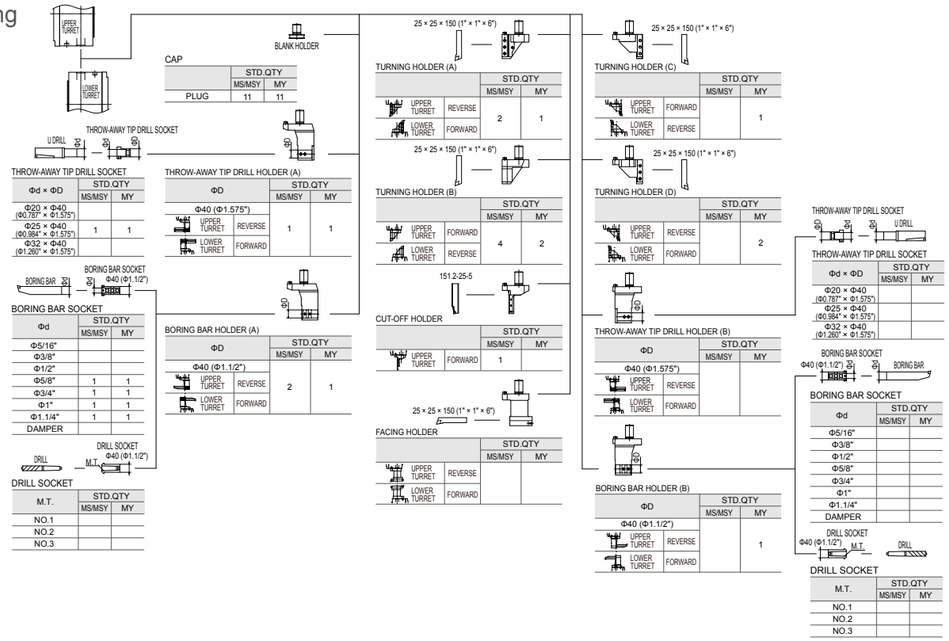
SPECIFICATION	STD.QTY
AR25-OH-6 Φ6 (0.236")	
AR25-OH-6.5 Φ6.5 (0.256")	
AR25-OH-7 Φ7 (0.276")	
AR25-OH-7.5 Φ7.5 (0.295")	
AR25-OH-8 Φ8 (0.315")	
AR25-OH-8.5 Φ8.5 (0.335")	
AR25-OH-9 Φ9 (0.354")	
AR25-OH-9.5 Φ9.5 (0.374")	
AR25-OH-10 Φ10 (0.394")	
AR25-OH-10.5 Φ10.5 (0.413")	
AR25-OH-11 Φ11 (0.433")	
AR25-OH-11.5 Φ11.5 (0.453")	
AR25-OH-12 Φ12 (0.472")	
AR25-OH-12.5 Φ12.5 (0.492")	
AR25-OH-13 Φ13 (0.512")	
AR25-OH-13.5 Φ13.5 (0.532")	
AR25-OH-14 Φ14 (0.551")	
AR25-OH-14.5 Φ14.5 (0.571")	
AR25-OH-15 Φ15 (0.591")	
AR25-OH-15.5 Φ15.5 (0.610")	
AR25-OH-16 Φ15 (0.630")	

Tooling System

Unit : mm (inch)

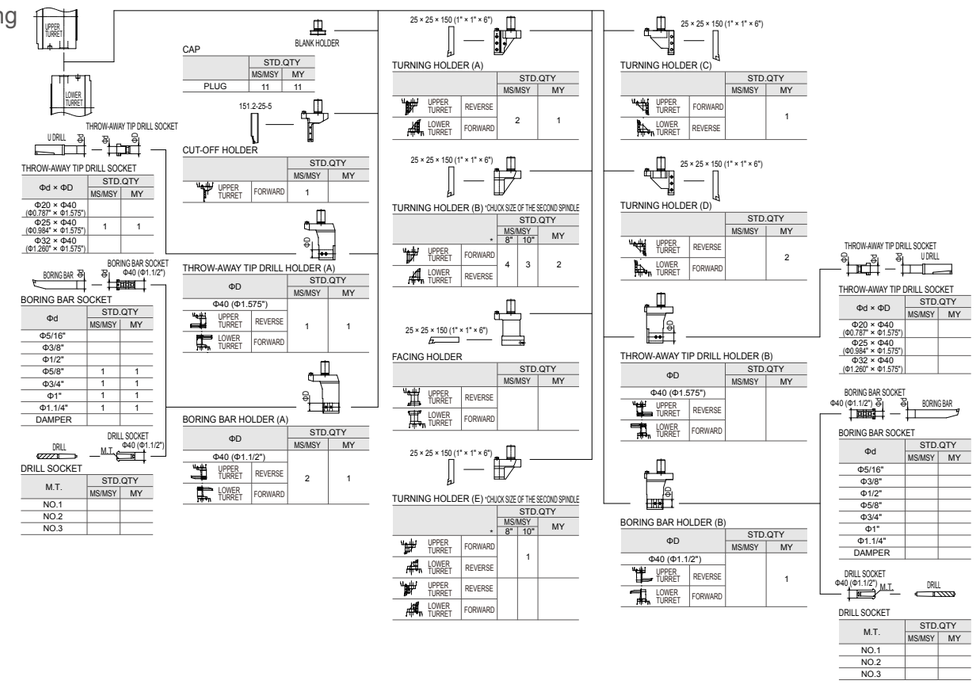
HQR-200 series 12 position upper / lower turret

Turning



HQR-250 series 12 position upper / lower turret

Turning

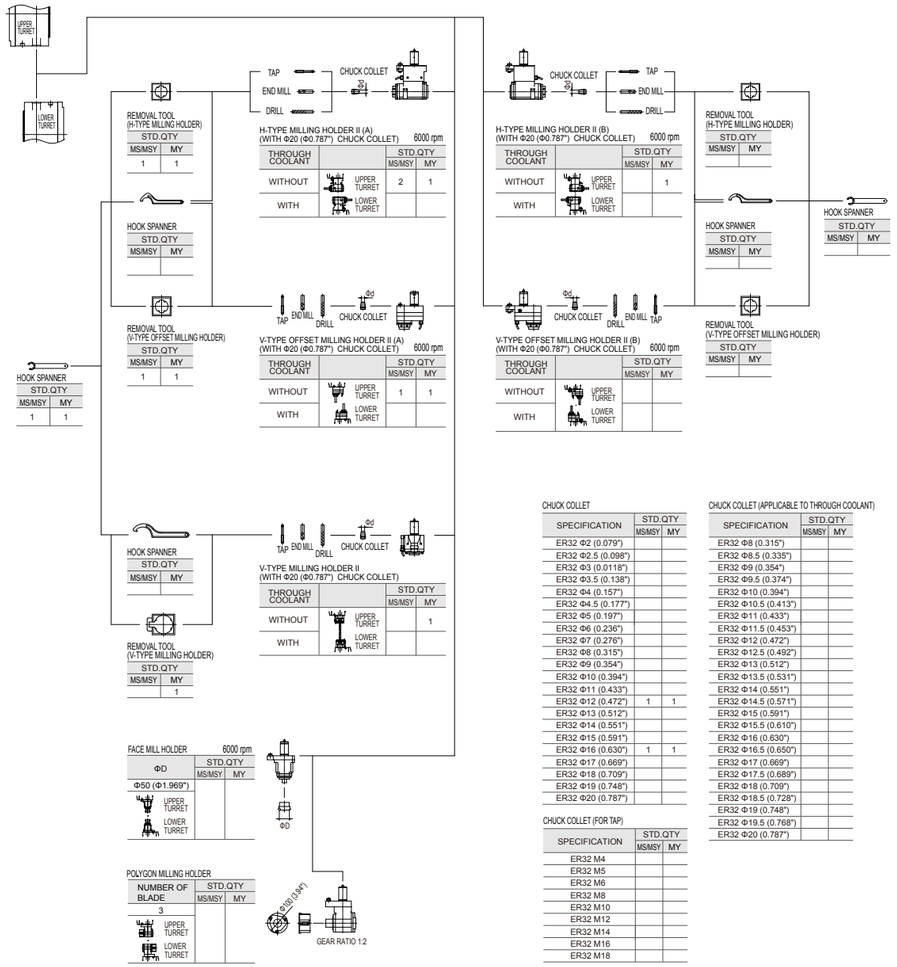


Tooling System

Unit : mm (inch)

HQR-200, 250 series 12 position upper / lower turret

Milling



CHUCK COLLET

SPECIFICATION	STD.QTY MS/MSY	STD.QTY MY
ER32 Φ2 (0.079")		
ER32 Φ2.5 (0.098")		
ER32 Φ3 (0.0118")		
ER32 Φ3.5 (0.138")		
ER32 Φ4 (0.157")		
ER32 Φ4.5 (0.177")		
ER32 Φ5 (0.197")		
ER32 Φ6 (0.236")		
ER32 Φ7 (0.276")		
ER32 Φ8 (0.315")		
ER32 Φ9 (0.354")		
ER32 Φ10 (0.394")		
ER32 Φ11 (0.433")		
ER32 Φ12 (0.472")	1	1
ER32 Φ13 (0.512")		
ER32 Φ14 (0.551")		
ER32 Φ15 (0.591")		
ER32 Φ16 (0.630")	1	1
ER32 Φ17 (0.669")		
ER32 Φ18 (0.709")		
ER32 Φ19 (0.748")		
ER32 Φ20 (0.787")		

CHUCK COLLET (APPLICABLE TO THROUGH COOLANT)

SPECIFICATION	STD.QTY MS/MSY	STD.QTY MY
ER32 Φ8 (0.315")		
ER32 Φ8.5 (0.335")		
ER32 Φ9 (0.354")		
ER32 Φ9.5 (0.374")		
ER32 Φ10 (0.394")		
ER32 Φ10.5 (0.413")		
ER32 Φ11 (0.433")		
ER32 Φ11.5 (0.453")		
ER32 Φ12 (0.472")		
ER32 Φ12.5 (0.492")		
ER32 Φ13 (0.512")		
ER32 Φ13.5 (0.531")		
ER32 Φ14 (0.551")		
ER32 Φ14.5 (0.571")		
ER32 Φ15 (0.591")		
ER32 Φ15.5 (0.610")		
ER32 Φ16 (0.630")		
ER32 Φ16.5 (0.650")		
ER32 Φ17 (0.669")		
ER32 Φ17.5 (0.689")		
ER32 Φ18 (0.709")		
ER32 Φ18.5 (0.728")		
ER32 Φ19 (0.748")		
ER32 Φ19.5 (0.768")		
ER32 Φ20 (0.787")		

CHUCK COLLET (FOR TAP)

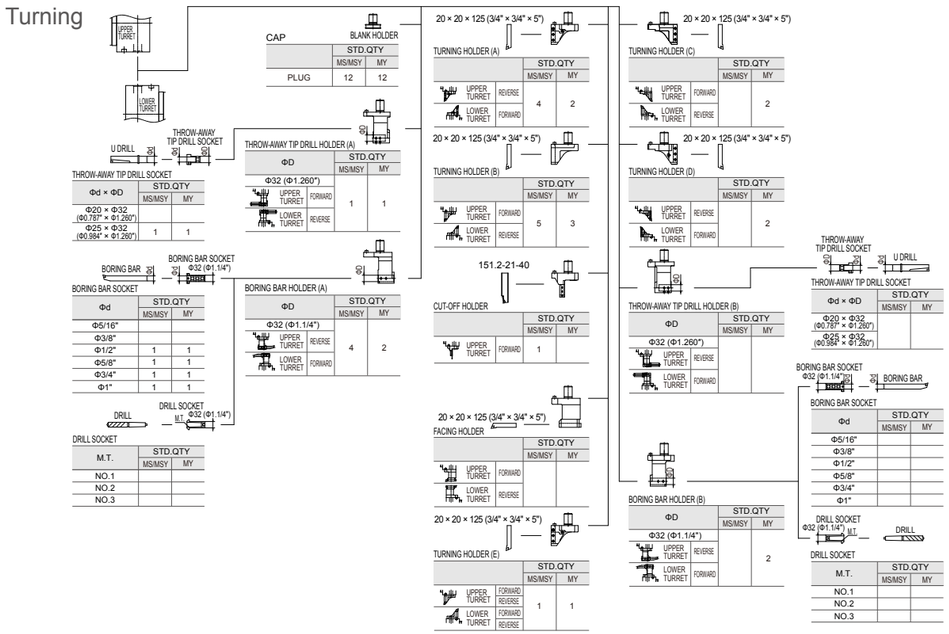
SPECIFICATION	STD.QTY MS/MSY	STD.QTY MY
ER32 M4		
ER32 M5		
ER32 M6		
ER32 M8		
ER32 M10		
ER32 M12		
ER32 M14		
ER32 M16		
ER32 M18		

Tooling System

Unit : mm (inch)

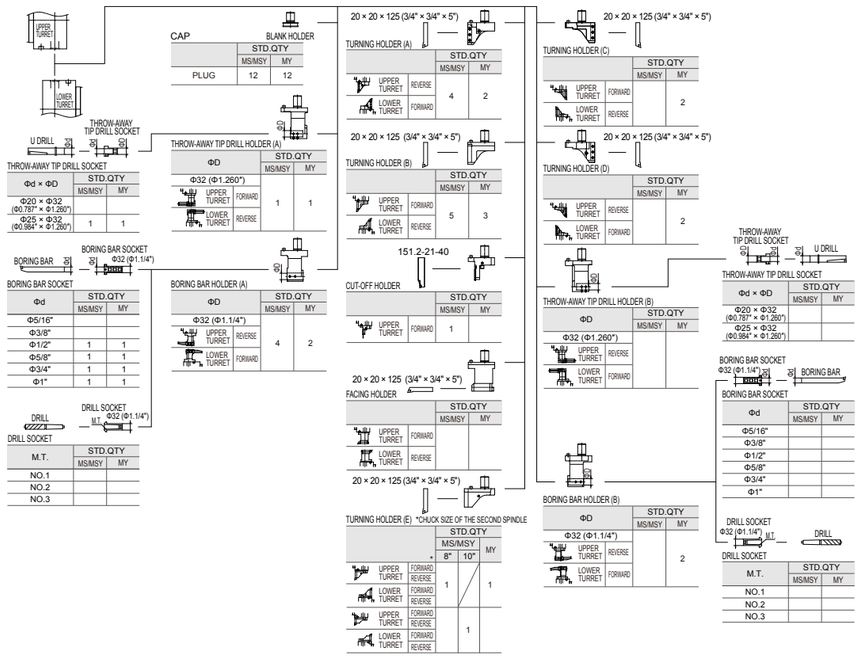
HQR-200 series 16 position upper / lower turret (OPTION)

Turning



HQR-250 series 16 position upper / lower turret (OPTION)

Turning

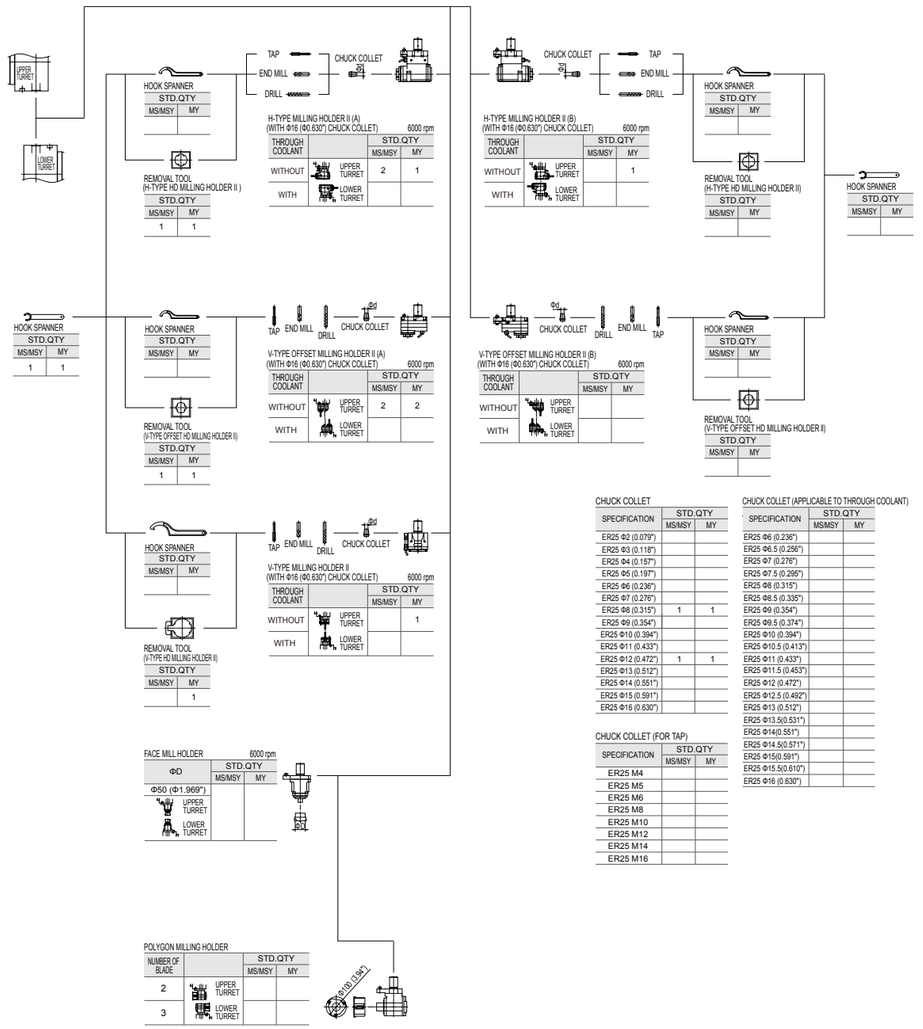


Tooling System

Unit : mm (inch)

HQR-200, 250 series 16 position upper / lower turret (OPTION)

Milling



CHUCK COLLET

SPECIFICATION	STD.QTY MS/MSY	MY
ER25 Φ2 (0.079")		
ER25 Φ3 (0.118")		
ER25 Φ4 (0.157")		
ER25 Φ5 (0.197")		
ER25 Φ6 (0.236")		
ER25 Φ7 (0.276")		
ER25 Φ8 (0.315")	1	1
ER25 Φ9 (0.354")		
ER25 Φ10 (0.394")		
ER25 Φ11 (0.433")		
ER25 Φ12 (0.472")	1	1
ER25 Φ13 (0.512")		
ER25 Φ14 (0.551")		
ER25 Φ15 (0.591")		
ER25 Φ16 (0.630")		

CHUCK COLLET (APPLICABLE TO THROUGH COOLANT)

SPECIFICATION	STD.QTY MS/MSY	MY
ER25 Φ6 (0.236")		
ER25 Φ6.5 (0.256")		
ER25 Φ7 (0.276")		
ER25 Φ7.5 (0.295")		
ER25 Φ8 (0.315")		
ER25 Φ8.5 (0.335")		
ER25 Φ9 (0.354")		
ER25 Φ9.5 (0.374")		
ER25 Φ10 (0.394")		
ER25 Φ10.5 (0.413")		
ER25 Φ11 (0.433")		
ER25 Φ11.5 (0.453")		
ER25 Φ12 (0.472")		
ER25 Φ12.5 (0.492")		
ER25 Φ13 (0.512")		
ER25 Φ13.5(0.531")		
ER25 Φ14(0.551")		
ER25 Φ14.5(0.571")		
ER25 Φ15(0.591")		
ER25 Φ15.5(0.610")		
ER25 Φ16 (0.630")		

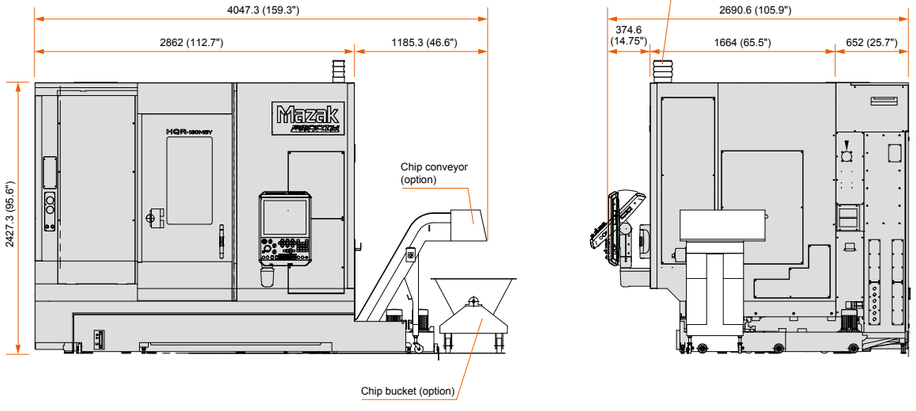
CHUCK COLLET (FOR TAP)

SPECIFICATION	STD.QTY MS/MSY	MY
ER25 M4		
ER25 M5		
ER25 M6		
ER25 M8		
ER25 M10		
ER25 M12		
ER25 M14		
ER25 M16		

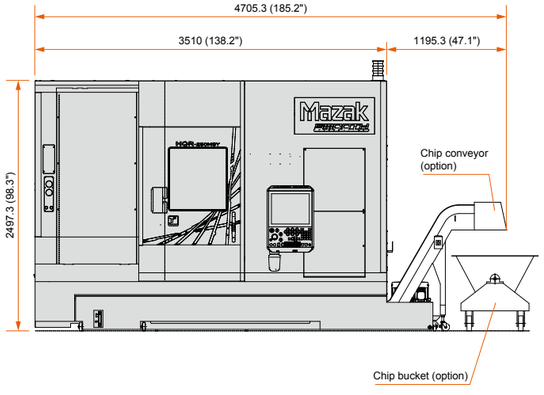
Machine Dimensions

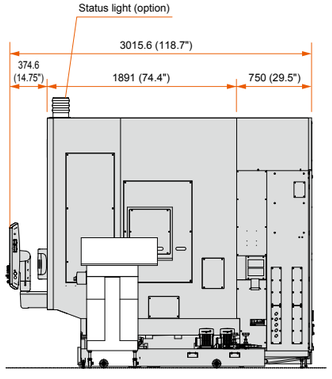
Unit : mm (inch)

HQR-100MSY, 150MSY



HQR-200MS, 200MSY, 250MS, 250MSY (850U)
HQR-200MY, 250MY (700U)





Machine Dimensions

Unit : mm (inch)

HQR-200MS, 200MSY, 250MS, 250MSY 1300U (1300U)