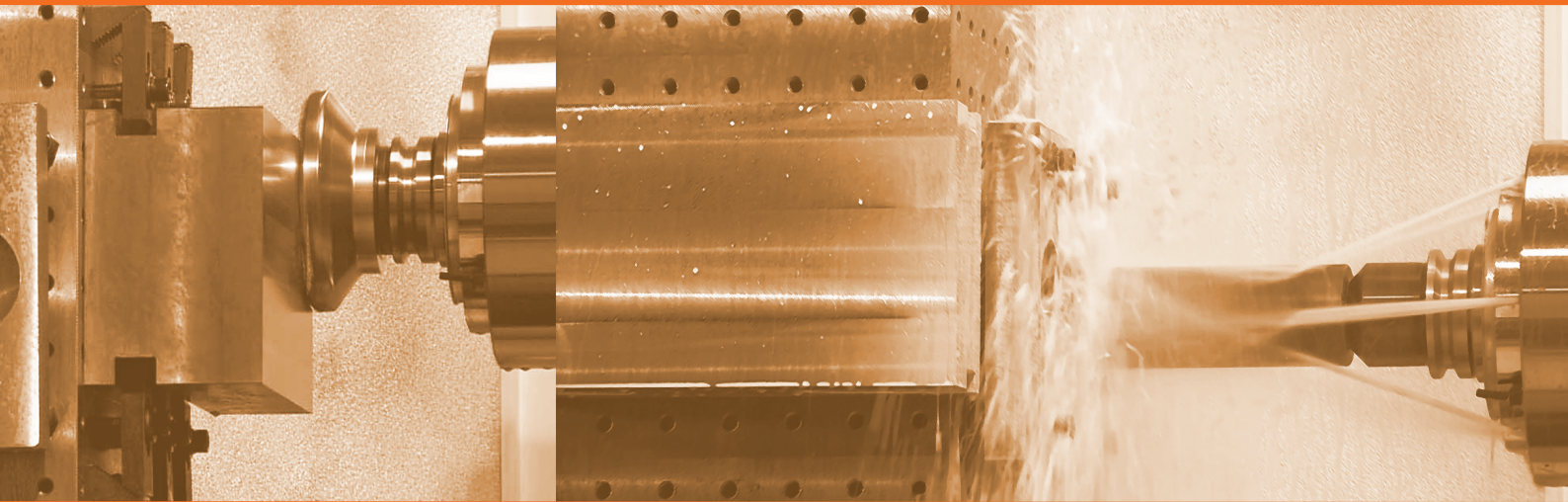
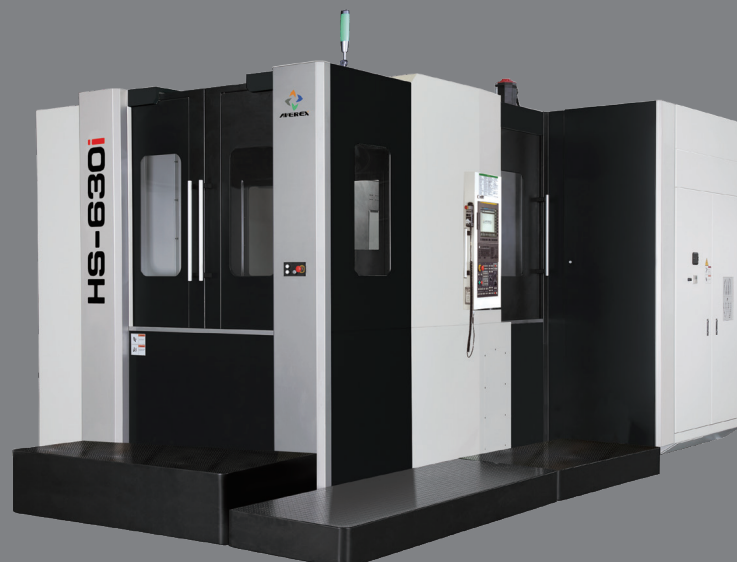




HS-630i



Ultimate High Speed Horizontal Machining Center



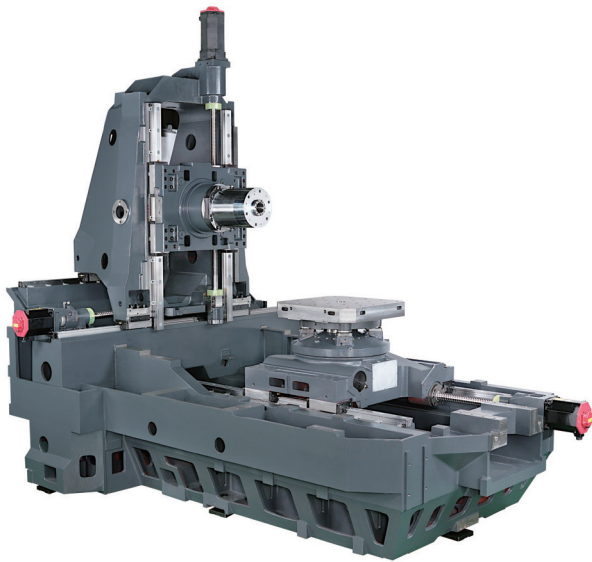
AVEREX AUTOMATION CO., LTD.

HS-630i

Averex HS-630i is an ultimate high speed, high precision and fully expandable horizontal machining center. It comes with highly advanced technology that enriched with manufacturing techniques and superior quality throughout. The Averex "concept" is simply - utilize proven technology, make it flexible and make it affordable.



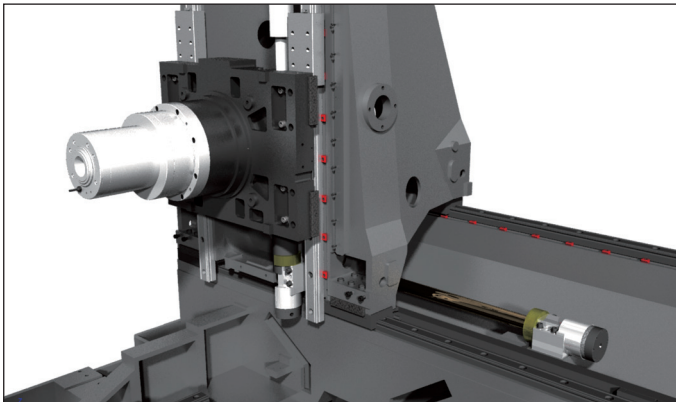
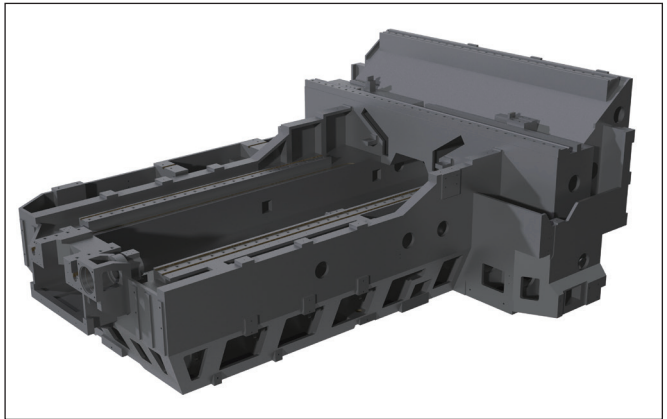
Main Features



- One-piece machine base casting for long term cutting rigidity and precision.

Rigid Structure

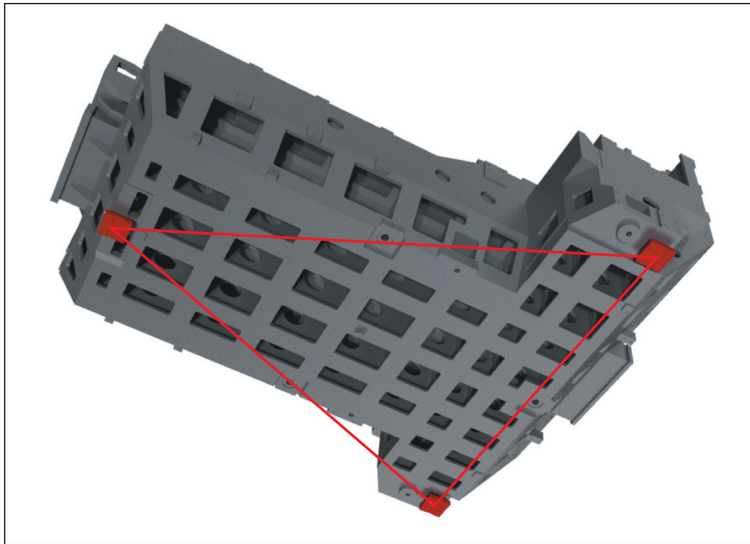
The dual-wall machine column is a symmetrical casting design for thermal stability. The machine base is made of a heavily ribbed, one-piece cast iron to ensure the superb rigidity for cutting exotic materials.



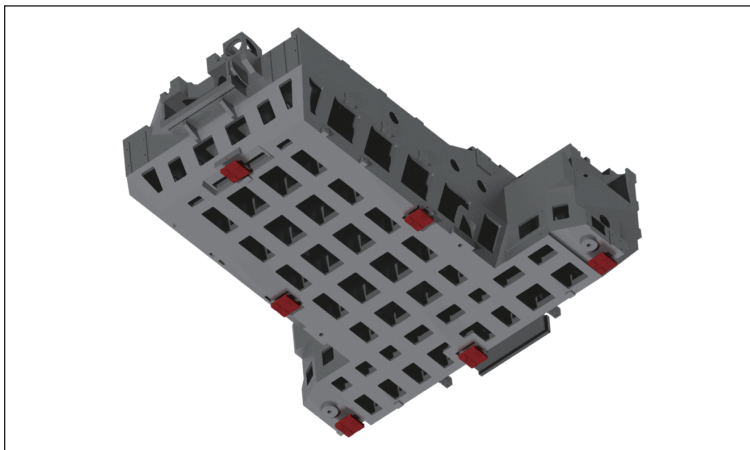
- Stepped castings design on machine base to increase the cutting rigidity.

- 100% Hand-scraping



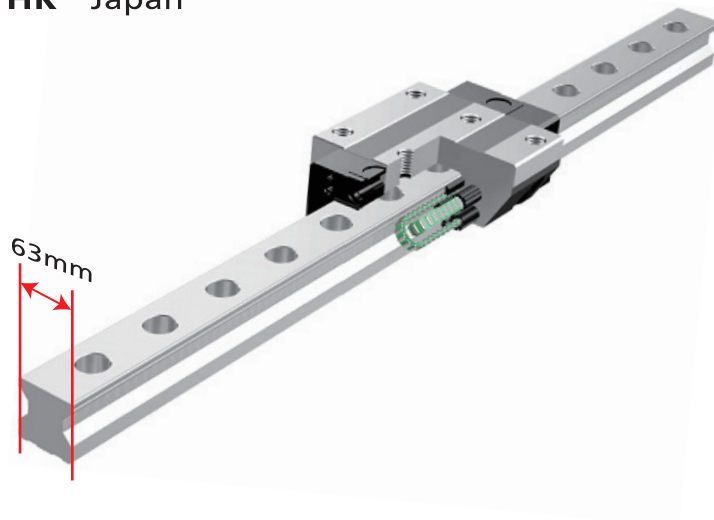


■ 3 Points Leveling



■ 6 Points Foundation Supports

■ Roller Guides by **THK[®]** Japan



■ Precision Ball Screws by **TSUBAKI[®]** Japan



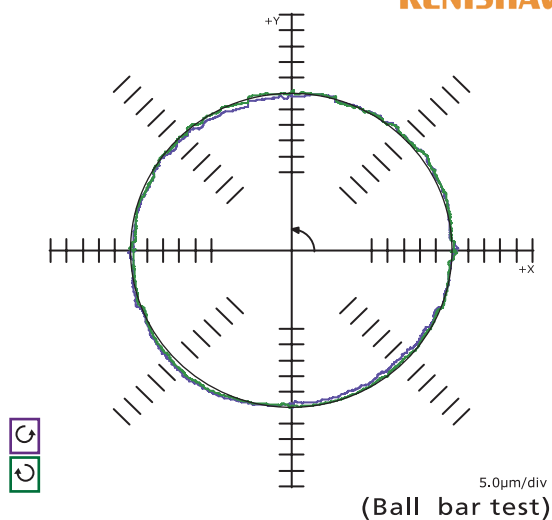
Main Features

High Speed

Specs \ 630i	X Y Z
Rapid	50 m/min
Cutting	20 m/min
Acceleration	0.7 G/1 G/0.9 G

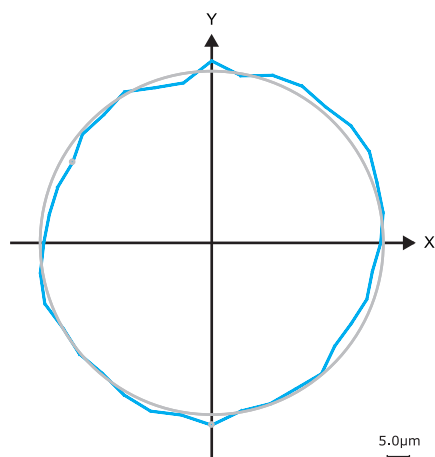
High Precision

RENISHAW



Circularity: **4.9*** µm

Feed Rate	1,000 mm/min
Radius	150 mm



Roundness: **4.8*** µm

Material	AL6610 (Φ 200 mm)
Tool	Φ20 mm (3T)
Spindle Speed	4,777 rpm
Feed Rate	1,453 mm/min

* Data obtained from a machine with a solid foundation in a temperature control environment.

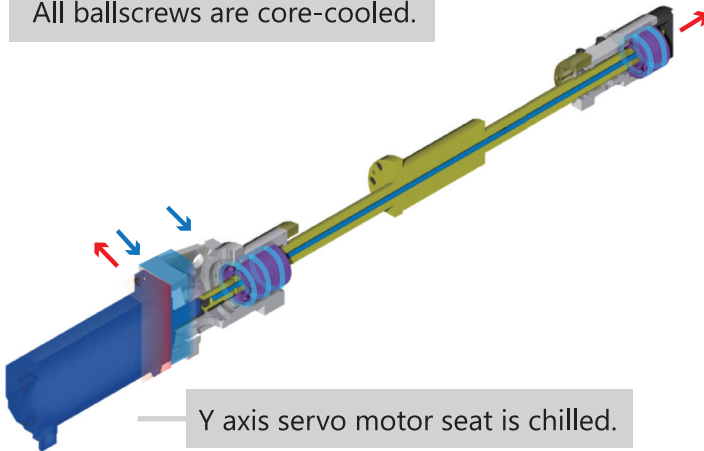
Positioning & Repeatability (ISO 10791-4)

Standard Code	ISO 10791-4	HS-630i
Travel	Full Stroke	Full Stroke
Positioning A	0.025 mm (0.00098")	0.0029 mm (0.00011")
Repeatability R	0.015 mm (0.00059")	0.0021 mm (0.00008")

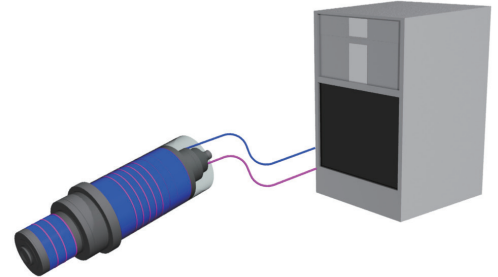
Main Features

Thermal Stability

All ballscrews are core-cooled.



Y axis servo motor seat is chilled.



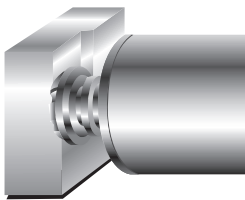
Spindle temperature is constantly controlled by oil chiller.

Superior Cutting Performance

(10,000 rpm standard spindle)

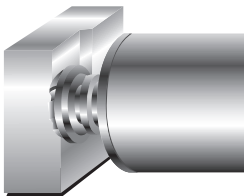
Maximum
Chip Removal

Face Milling Chip Removal Rate: **4800** cc/min Material : Al (6061)



Tool	Ø100mm x 7T
Spindle Speed	10,000 rpm
Feed Rate	12,000 mm/min
Width of Cut	80 mm
Depth of Cut	5.0 mm
Spindle Load	139 %

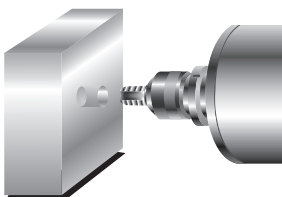
Face Milling Chip Removal Rate: **272** cc/min Material : Steel (S45C)



Tool	Ø160mm x 8T
Spindle Speed	320 rpm
Feed Rate	256 mm/min
Width of Cut	125 mm
Depth of Cut	8.5 mm
Spindle Load	90 %

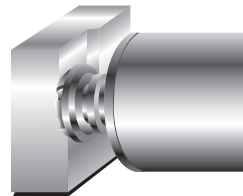
Rigid Tapping

Material : Steel (S45C)



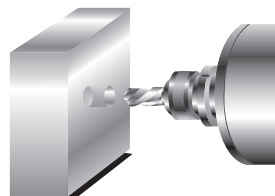
Tool	M56X5.5P
Spindle Speed	58 rpm
Feed Rate	319 mm/min
Spindle Load	175 %

Face Milling Chip Removal Rate: **1015** cc/min Material : Steel (S45C)



Tool	Ø125mm x 8T
Spindle Speed	675 rpm
Feed Rate	3,240 mm/min
Width of Cut	110 mm
Depth of Cut	2.85 mm
Spindle Load	140 %

Drilling Chip Removal Rate: **527.8** cc/min Material : Steel (S45C)



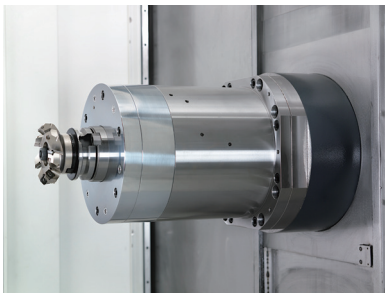
Tool	Ø80mm x 2T
Spindle Speed	750 rpm
Feed Rate	188.4 mm/min
Spindle Load	100 %

Main Features

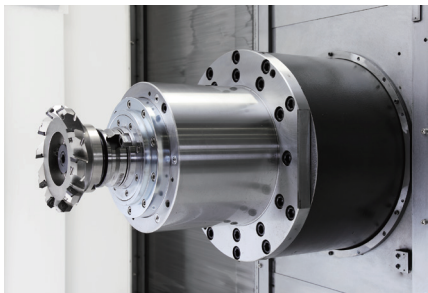
Spindle

Spindle	Standard	High Torque OP
Max. Spindle Speed	10,000 rpm	8,000 rpm
Spindle Motor Power	45 kW	55 kW
Spindle Rated Torque	623 Nm	1,202 Nm

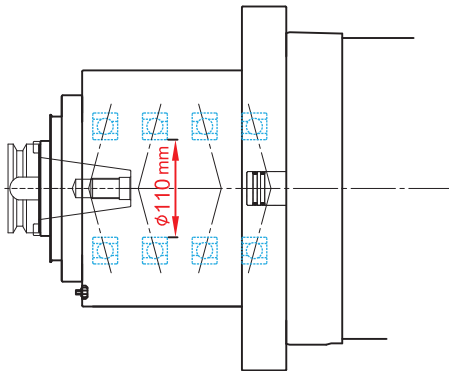
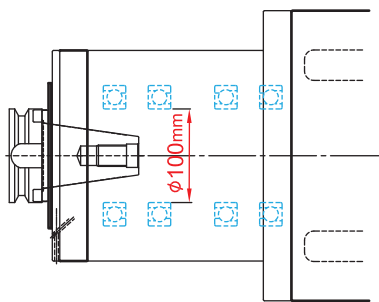
Oversized ceramic spindle bearings are utilized for superior cutting performance and constant precision.



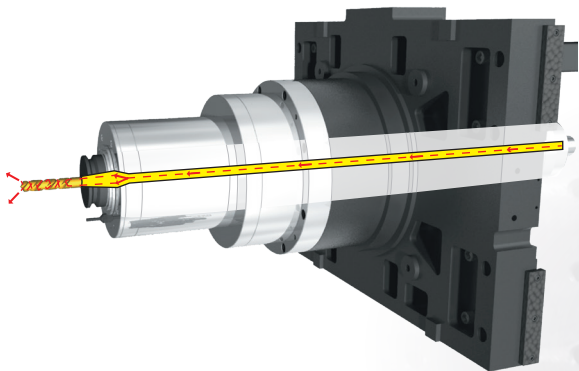
10,000 rpm **ST**



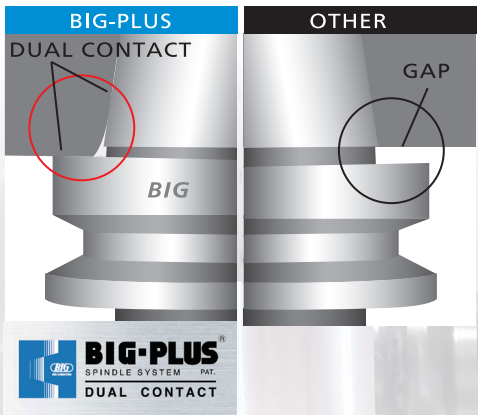
8,000 rpm **OP**



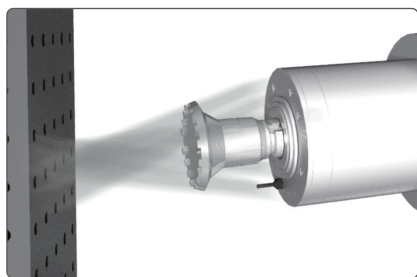
30 Bar Coolant Thru Spindle **ST**



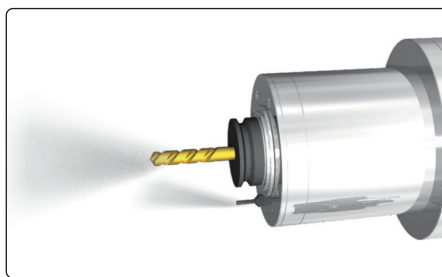
BBT Dual Surface Contact Spindle Design **ST**



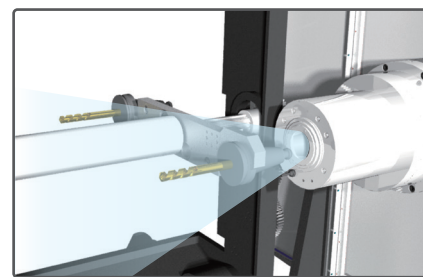
6 Spindle Coolant Nozzles



Cutting Air Thru Spindle



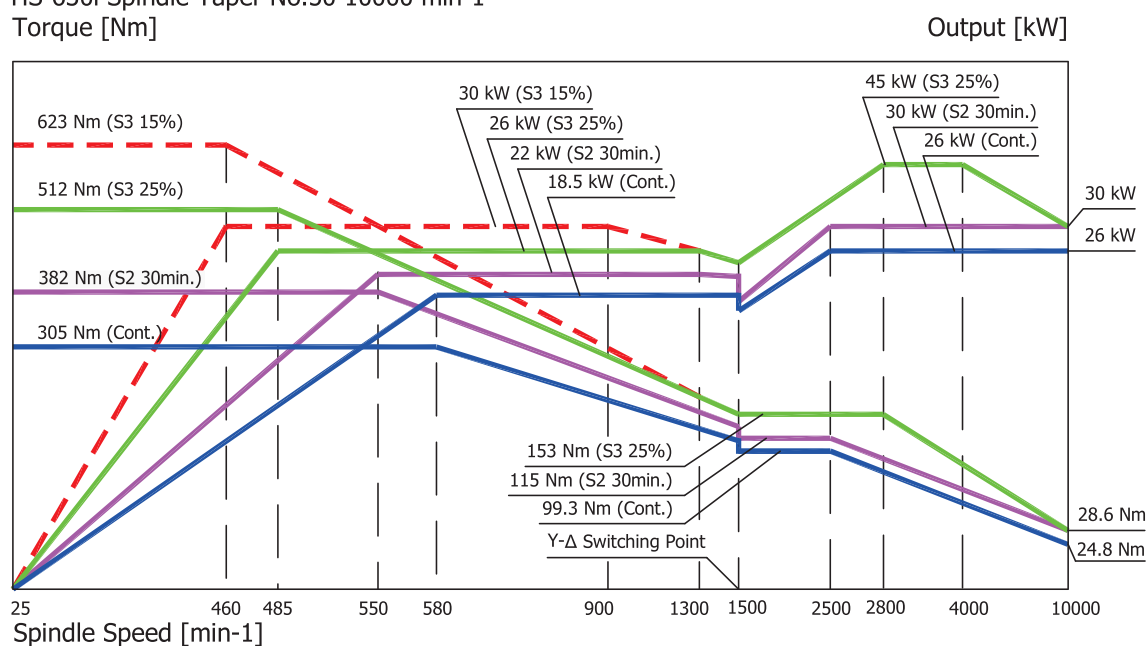
Spindle Air Blast (tool changing)



Spindle Output Diagrams

Standard

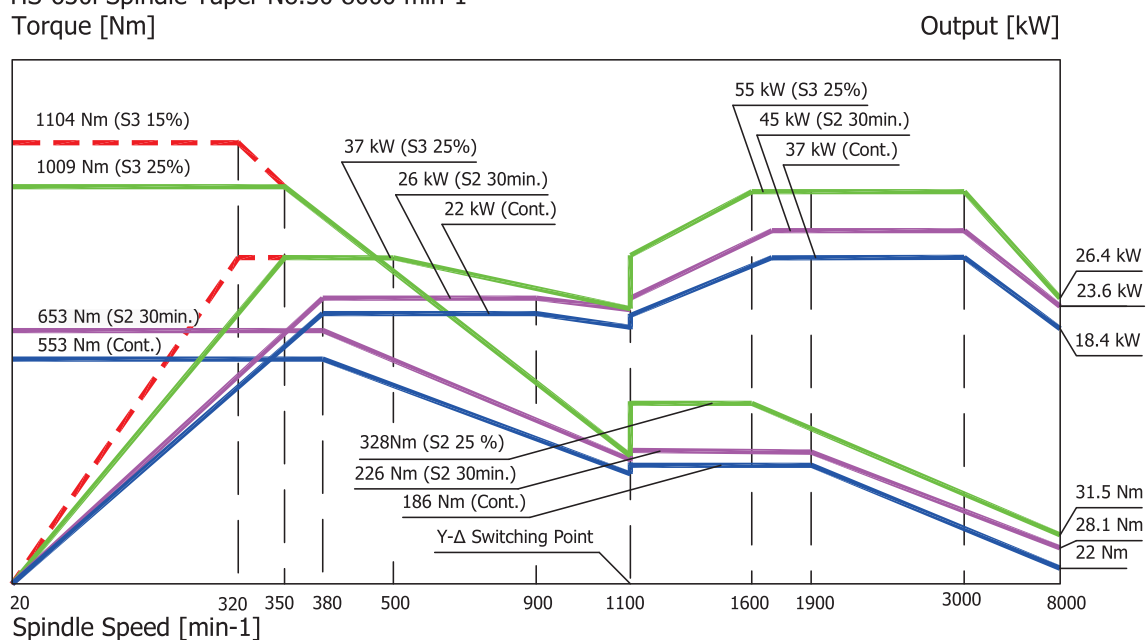
HS-630i Spindle Taper No.50 10000 min-1
Torque [Nm]



High Torque

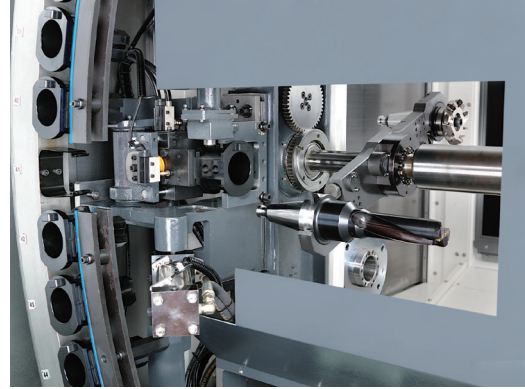
OP

HS-630i Spindle Taper No.50 8000 min-1
Torque [Nm]

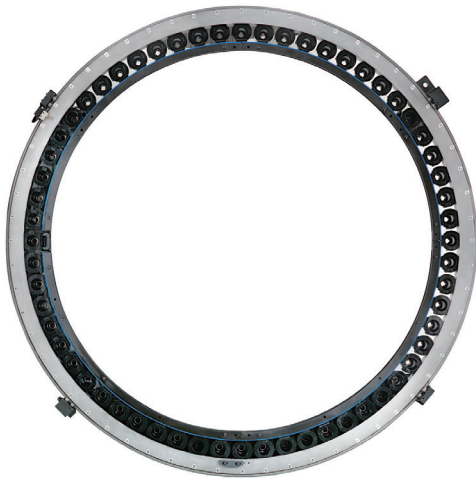


Automatic Tool Changer (ATC)

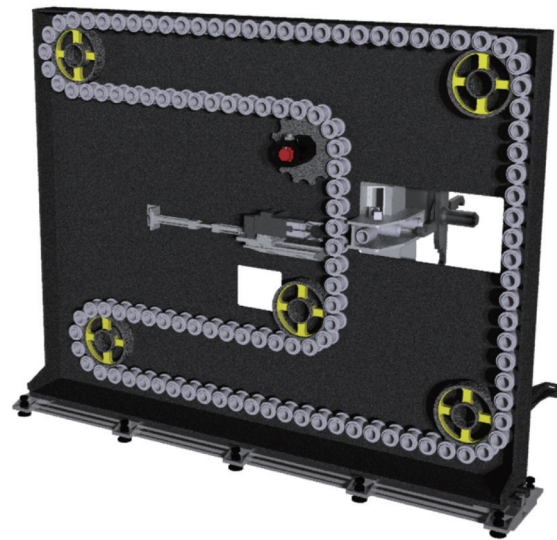
- 60 tools capacity tool magazine.
- Tool magazine is servo motor driven.
- Tool searching is fully programmable (stop/go,slow,fast).



■ Ring Type 60 Tools ST

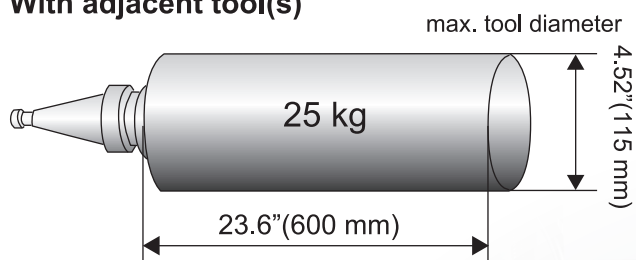


■ Chain Type 120 Tools OP

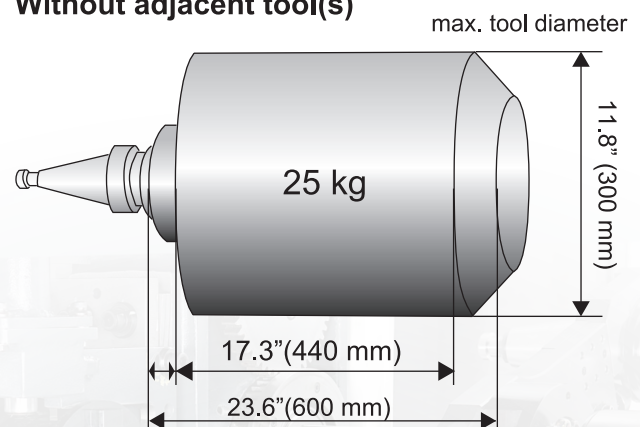


■ Tool Specifications

With adjacent tool(s)



Without adjacent tool(s)



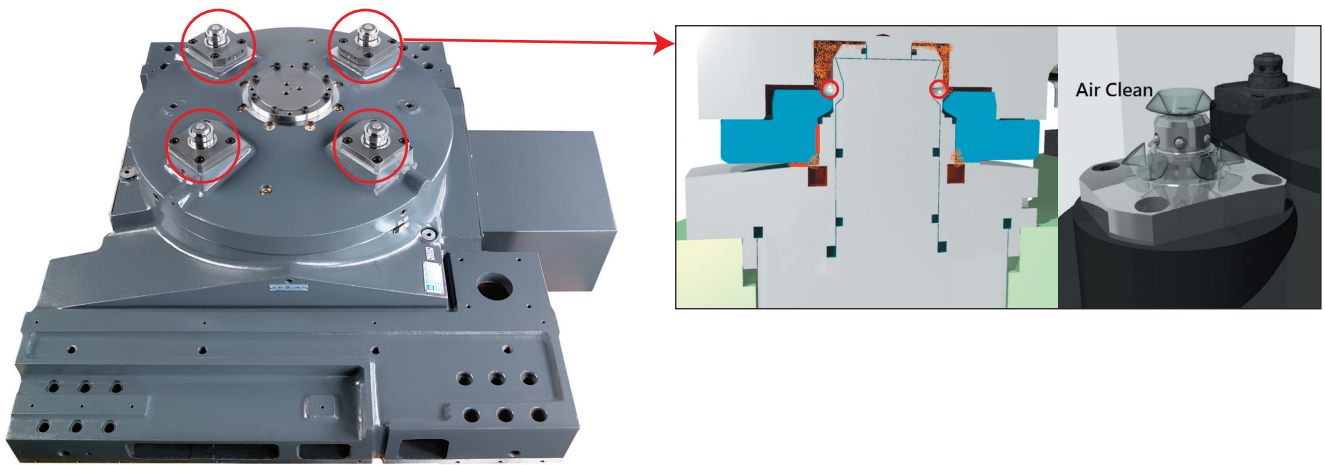
Automatic Pallet Changer (APC)

Rotary Table

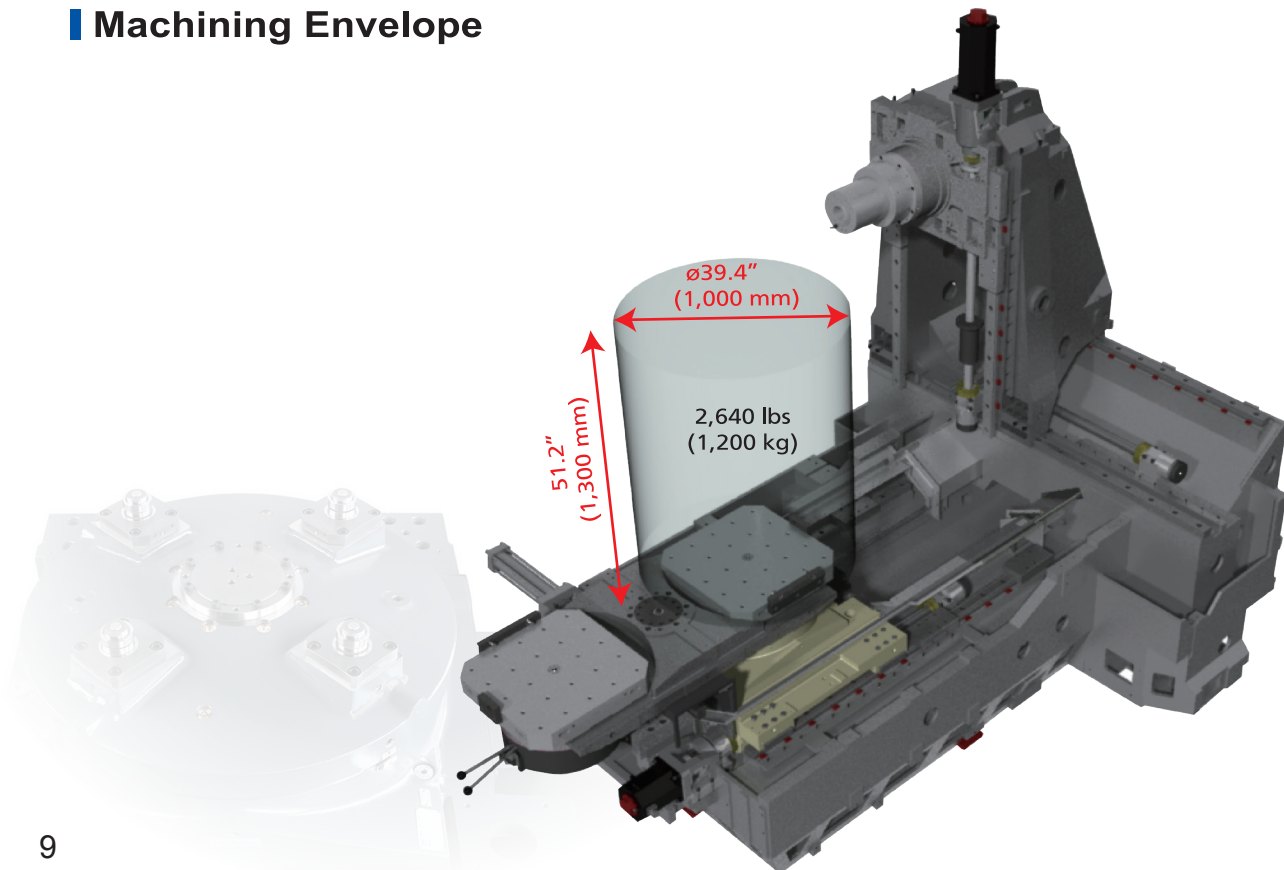
- Standard: PARKSON® 1° indexing Table.
- Optional:
 - PARKSON® 0.001° full 4th axis Rotary Table.

Pallet Clamping System

- 4 tapered cones equipped with air sensors to confirm the pallets are accurately positioned and seated.
- Pallets are mechanically clamped by a ball locking system which generates a powerful 6,400 kgf clamping force.
- High pressure air cleans the pallet during changing cycles.



Machining Envelope



6 Pallet Pool Expansion Unit



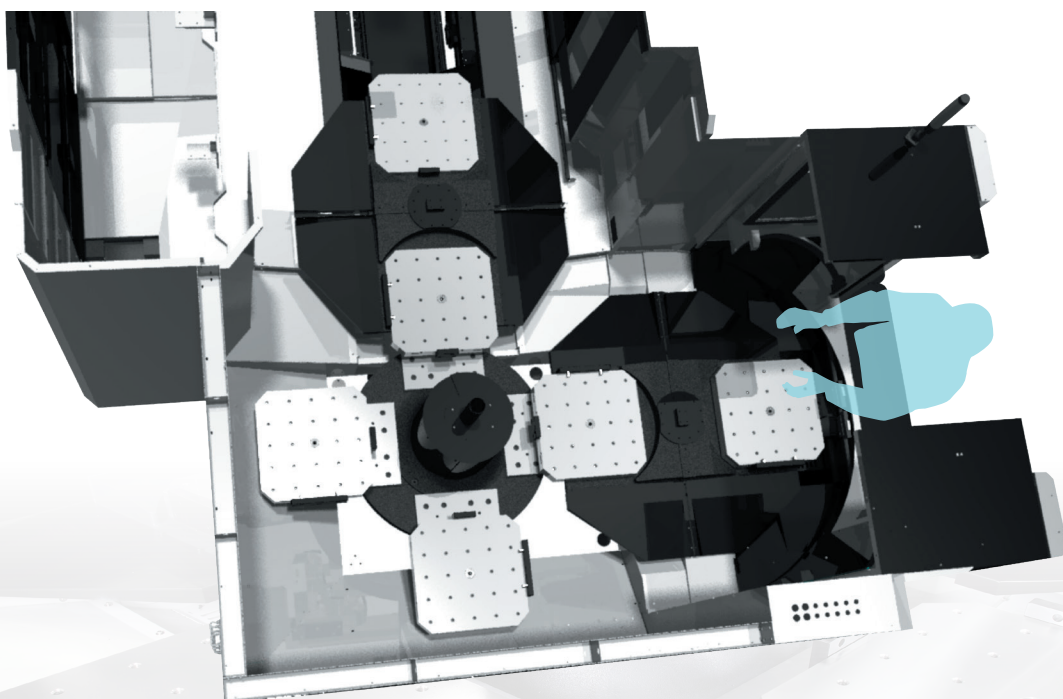
HS-630i 2 Pallets with 60 Tool Magazine



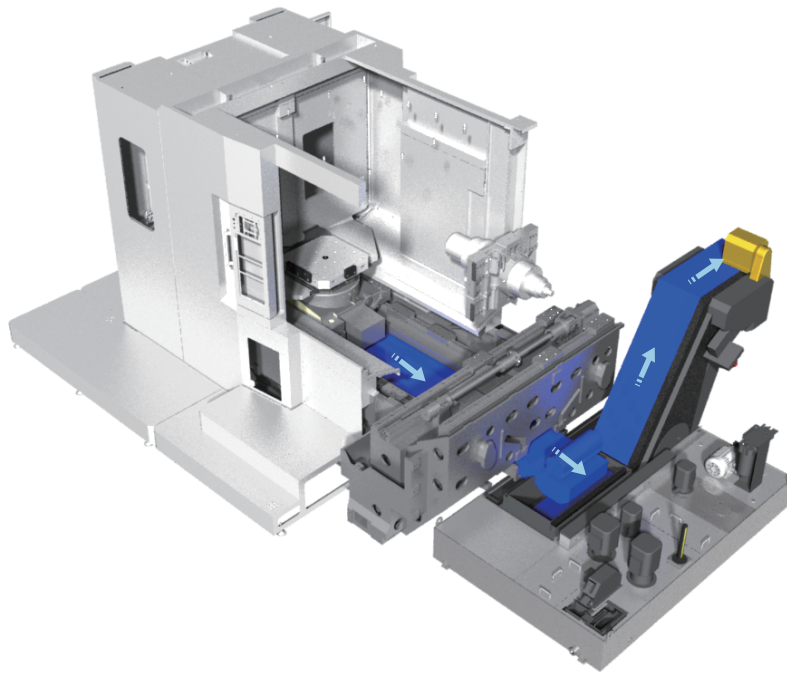
6 Pallet Expansion Unit



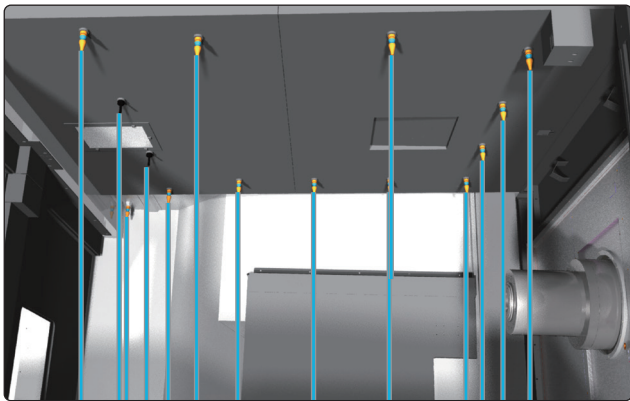
HS-630i with 6 Pallets and your choice of tool magazine



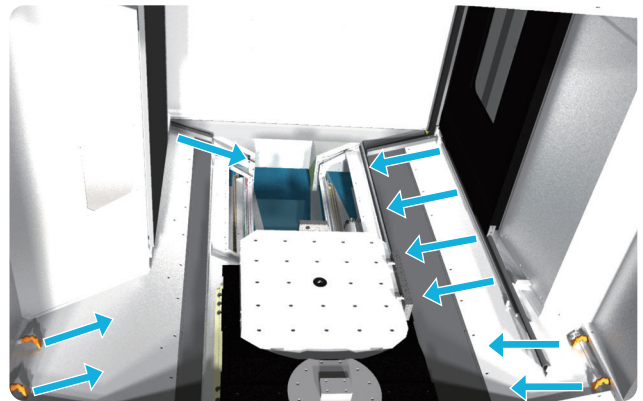
Efficient Chips Evacuation



Coolant Shower ST



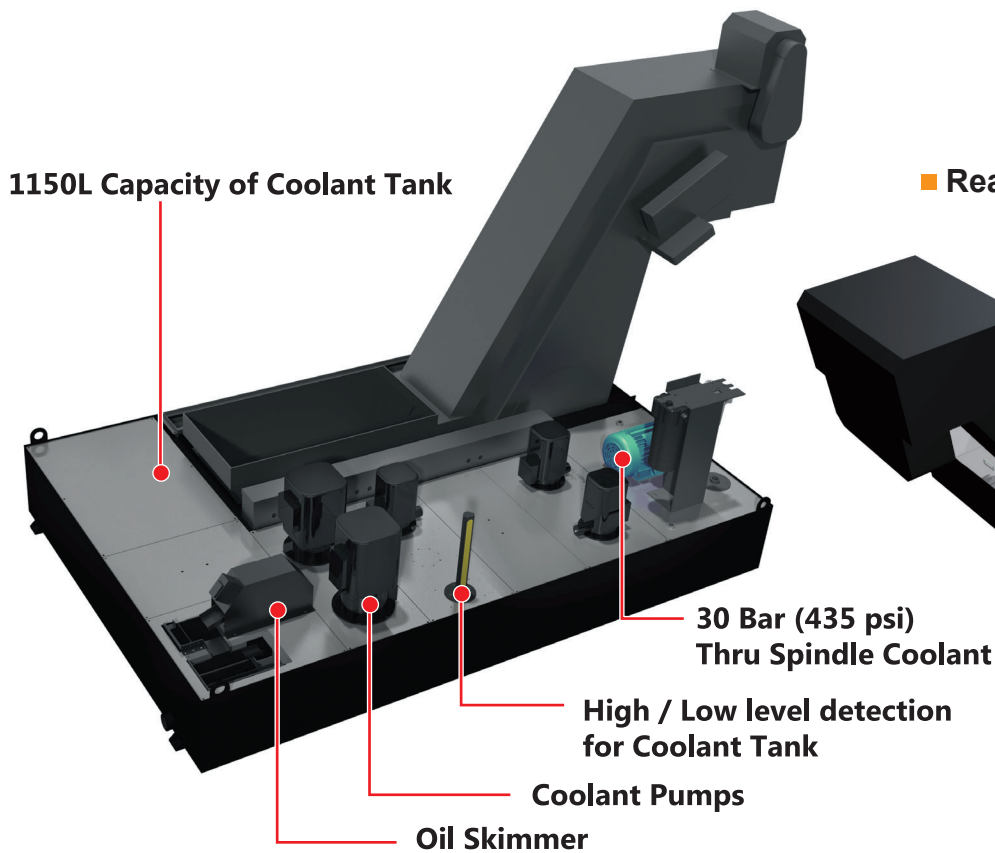
Flush Coolant System ST



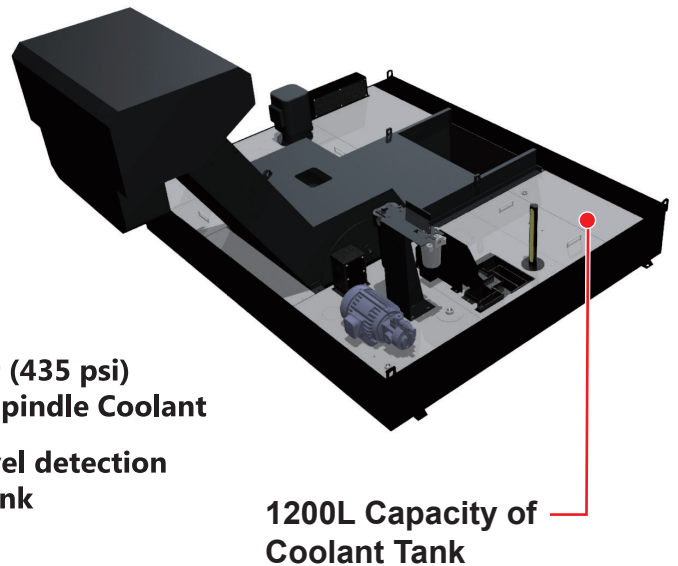
(Photo shows HS-630i with optional scraper roller type chip conveyor.)

Large Capacity Coolant Tank

Side Type (For 60 Tools) **ST**



Rear Type (For 120 Tools) **OP**

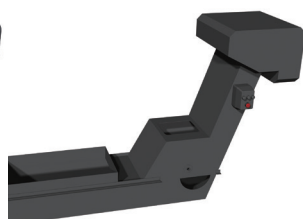


Chip Conveyor **OP**

Chip Type	Curly Iron Chip	Metallic Chip	Non-Curly Chip	Foundry Chip	Curly Aluminum Chip	Aluminum Chip	Brass Chip	Non-Metallic Chip
Steel Belt Type	●	●			●			●
Scraper Roller Type			●	●		●	●	
Magnetic Scraper Type			●	●				
Dual Belt Roller Type	●	●	●	●	●	●	●	●



Steel Belt Type



Scraper Roller Type



Magnetic Scraper Type

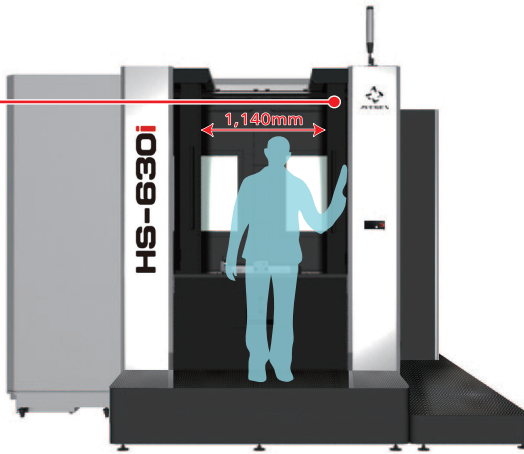


Dual Belt Roller Type

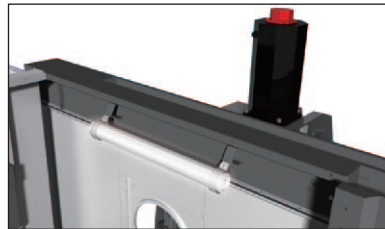
Operation & Maintenance



Loading/unloading working light



iPad monitor **OP**



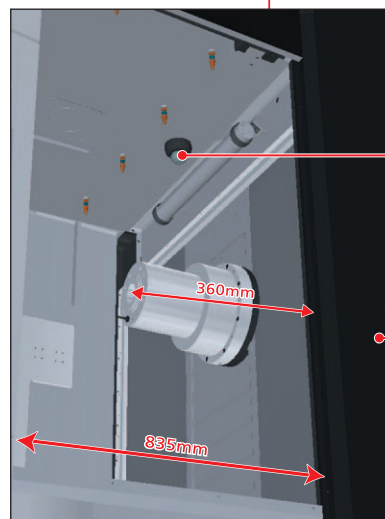
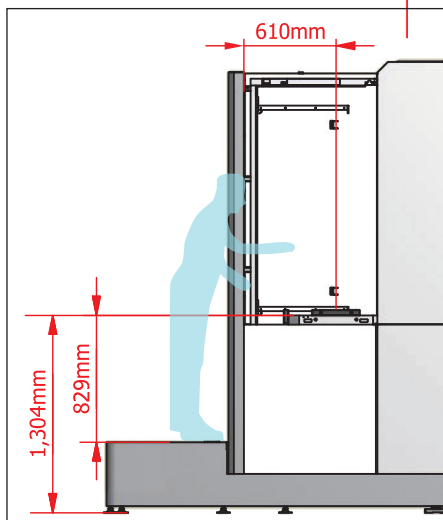
Machining zone working light



24/7 Weekly Timer



Heat Exchanger



Monitoring Camera **OP**



Manual tool clamp/unclamp

Optional Accessories

Optical Scale (X.Y.Z.B)



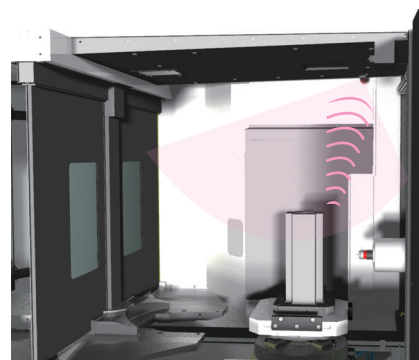
70 Bar (1,000 psi)

Coolant Thru Spindle

Azuus F2 Variable Volume High Pressure Coolant with Chips Filtration Systems

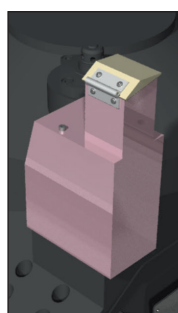


Work Piece Measurement

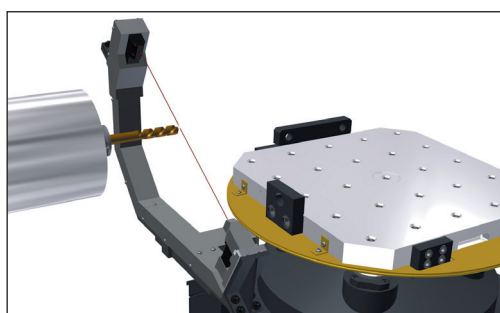
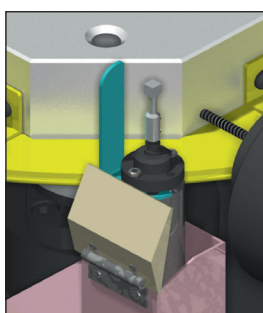


Tool Life Management

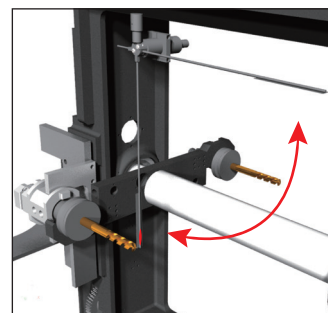
Touch Probe



Laser



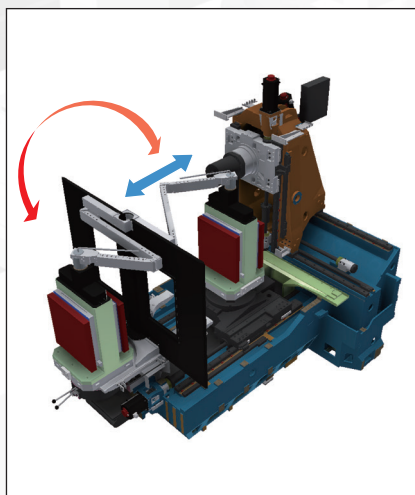
Tool Breakage Detection System (magazine)



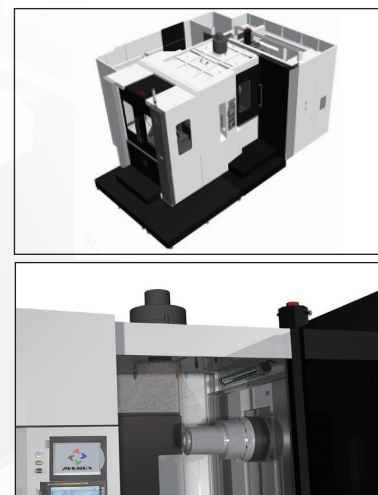
Window Spinning Wiper



Hydraulic Overhead Arms for Fixture



Coolant Mist Collector



AVEREX-FANUC MPro I⁺ **ST** / AVEREX-FANUC MPro III⁺ **OP**

Special Value Package



- 15" color LCD with iHMI
- 8MB part program memory
- HRV-III⁺ servo drives
- JERK control
- AICC II nano control with 200 blocks look ahead
- Smooth tolerance⁺ control
- Ethernet and CF/USB device
- Manual guide i
- Multi-language display
- High speed skip
- Addition of optional block skip
- Multi-step skip
- Rigid tapping
- Canned cycle for drilling
- Helical interpolation
- Circular interpolation
- Custom macro
- Custom macros-common variables #600~#999
- Tool life management
- 1000 registerable programs
- 48 pairs workpiece coordinate offsets
- Tool offset G45 to G48
- 400 pairs tool offsets
- Tool offset memory C
- Programmable data input G10
- Coordinate system rotation
- Polar coordinate command
- Scaling
- Program restart
- Manual handle interruption
- Manual handle retrace
- Programmable mirror image

- Programmable spindle tool load monitoring
- Programmable ATC speed
- Programmable tool magazine speed
- Stored stroke check 2
- Single direction positioning
- Cylindrical interpolation
- F1-digit feed
- Optional chamfering/corner R
- Playback function
- Interruption type custom macro
- Dynamic graphic display
- High-speed & high-quality machining package (Fine surface machining)

Optional

- Muti-pallets management table
- Data server with high-speed (Ethernet and 2GB memory)
- AI contour control II, high-speed processing
- 400 buffer blocks
- 300 pairs workpiece coordinate offsets
- Tool management function (64/240 tools)
- Tilted working plane
- Tool retract and recover
- Machine operation menu
- Machine remote diagnosis package
- AI Thermal Displacement Compensation**

Features

Number of controllable axes	4 axes (X/Y/Z/B)
Number of simultaneously controllable axes	4 axes (X/Y/Z/B)
Least input increment	0.001 mm / 1°
Least setting increment	0.001 mm / 1°
Bell shaped acceleration/deceleration before look-ahead interpolation	
HRV-III ⁺ high performance axis drives	
Inch / metric conversion	G20 / G21
AI contour control II	200 buffer blocks
Position Switch	

Feed Function

Cutting feed override	0 ~ 200% (by 10%)
Dwell	G04
Zero point return	G27 to G30
Handle feed	0.001 / 0.01 / 0.1 mm, 1°
Manual Jog feed	0 to 2,000 mm/min. (20 steps)
Dry run	
Rapid traverse rate override	0 / 8 / 15 / 25 / 50 / 100 (%)

Tool Function

Tool function	4-digit T code
Cutter compensation C	G40 to G42
Too length compensation	G43 / G44 / G49
Tool offset capacity	400 pairs
Tool offset memory C	
Tool life management	
Tool radius / tool nose radius compensation	

Editing Function

Tape code	EIA RS244 / ISO 840 automatic recognition
Input / output interface	RS232C, RJ45, CF card, USB
Part program storage length	8MB
Number of registered programs	1,000 programs
Search function	Program number search Sequence number search Address search
Extended part program editing	
Background editing	

Spindle Function

Spindle speed function	5-digit S code
Spindle speed override	50~150% (by 10%)

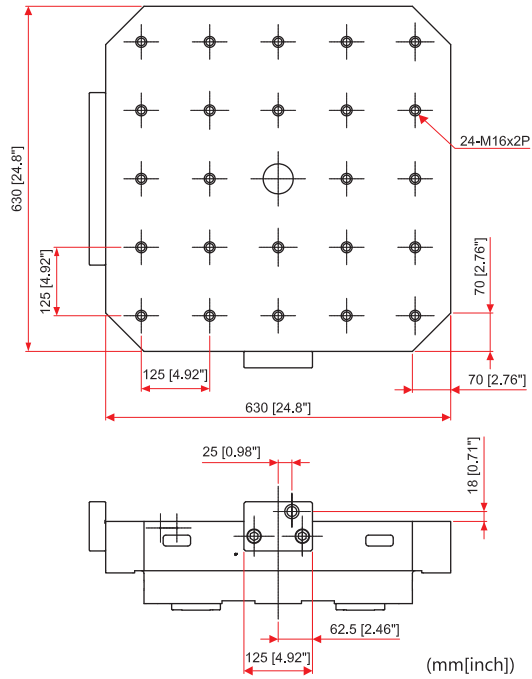
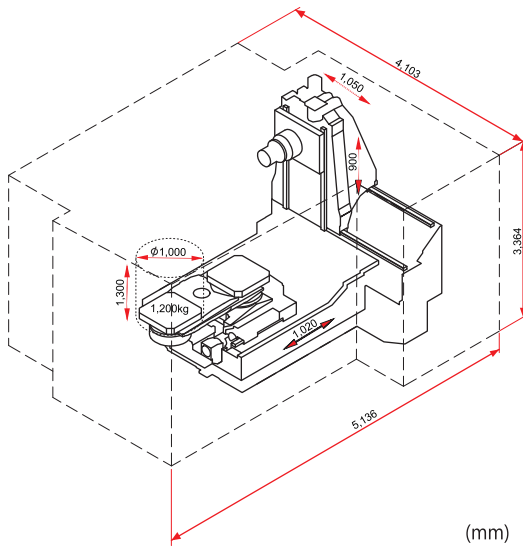
Program Input

Absolute / incremental programming	G90 / G91
Canned cycles	G73 / G74 / G76 / G80 to G89
Decimal point programming	Input by using decimal point
Circular interpolation by R programming	
Subprogram call	10 folds levels nested
Local / machine coordinate system	G52 / G53
Workpiece coordinate system	G54 ~ G59
Addition of work coordinate system	48 sets
Max. programmable dimension	±9-digit
M function	3-digit M code
Custom macro	

Others

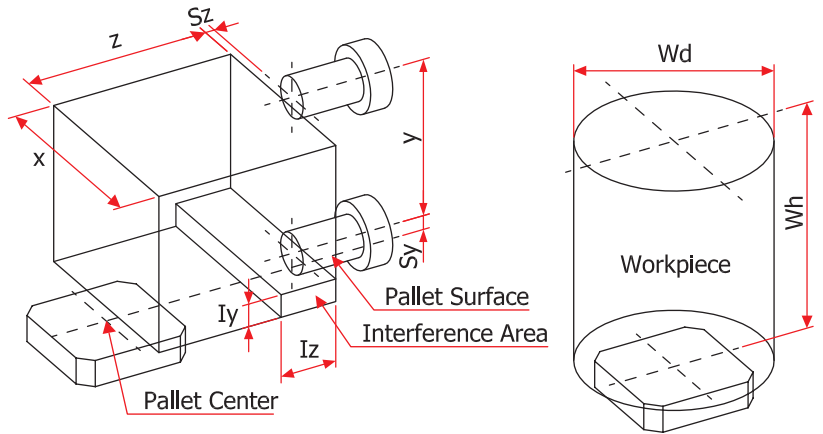
MDI / LCD Unit	15" color LCD, keyboard, and soft Keys
Programmable Data Input	G10
Rigid tapping	Synchronized tapping
Stored stroke check 1	
Help function	Explanation of alarm messages
Run hour and parts count display	
Operating monitor display	
Stored pitch error compensation	
Multi-language display	
Thread cutting	
Synchronous cutting	
Helical interpolation	
Ethernet function	

■ Pallet

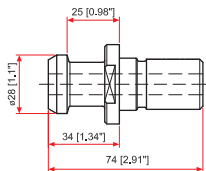


Working Zone

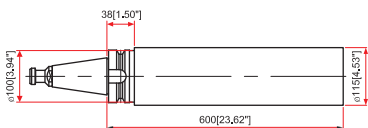
Item	Description	mm [inch]	
		10,000 rpm Spindle	8,000 rpm Spindle (Opt.)
y	Y-axes Travel	900 [35.4"]	880 [34.6"]
x	X-axes Travel	1050 [41.3"]	
z	Z-axes Travel	1020 [40.2"]	
Sz	Spindle Nose to Pallet Center	50 [2.0"]	
Sy	Spindle Center to Pallet Surface	80 [3.1"]	100 [3.9"]
Iy	Y-axes Interference	210 [8.3"]	260 [10.2"]
Iz	Z-axes Interference	315 [12.4"]	
Wh	Max. Workpiece Height	1300 [51.2"]	
Wd	Max. Workpiece Diameter	1000 [39.4"]	



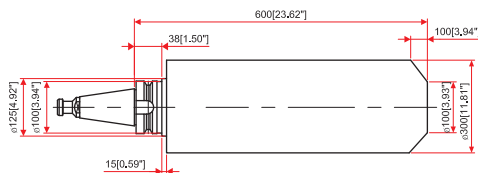
■ Tool



With adjacent tool(s)



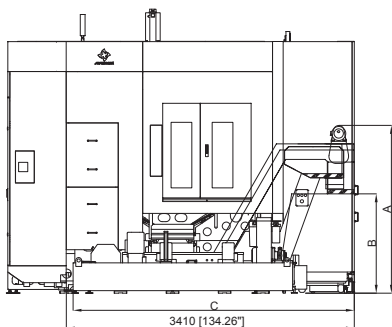
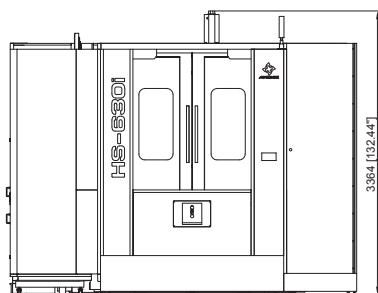
Without adjacent tool(s)



(mm[inch])

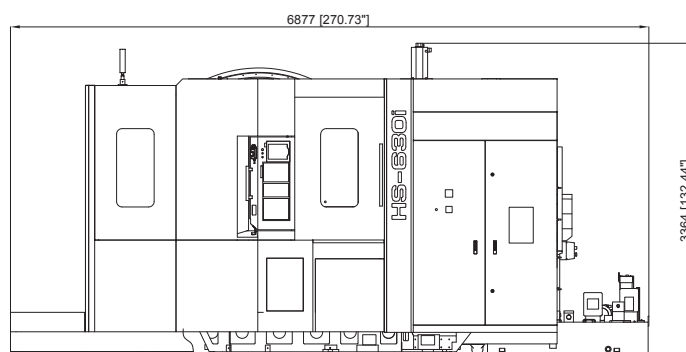
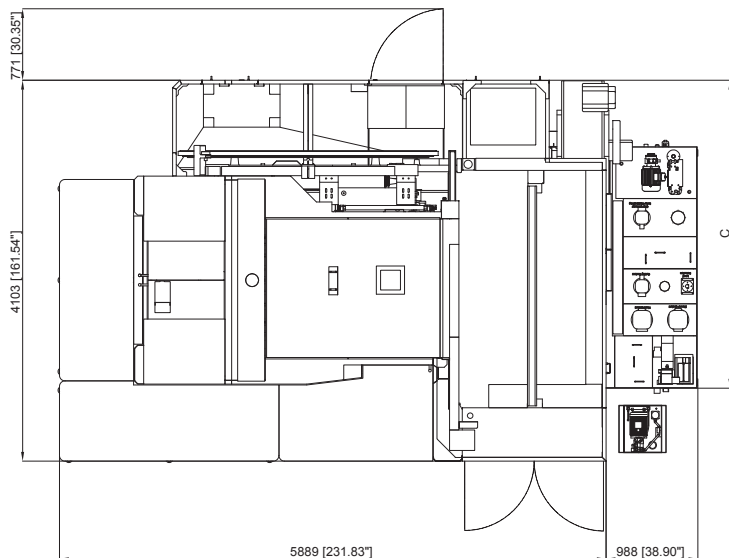
Tool Restriction	BBT	CAT	DIN
Max. Tool Diameter	ø115mm[4.53"]		
Max. Tool Length	600mm[23.62"]		
Max. Tool Weight	25kg[55lb]		
Max. Tool Diameter (no adjacent tools)	ø300mm[11.81"]		
Pull Studs	JIS50P M24x3P	DIN 69872(UNC) 1"-8 UNC	DIN 69872 M24x3P

2 APC with 60 Tool ATC



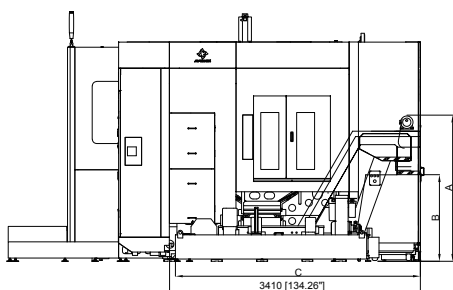
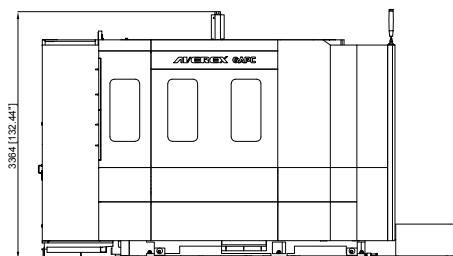
Chip Conveyor Type	A (mm [inch])	B (mm [inch])	C (mm [inch])
Scraper Roller Type	1687 [66.42"]	1067 [42.01"]	3292 [129.61"]
Steel Belt Type	1547 [60.91"]	1079 [42.48"]	3331 [131.14"]
Magnetic Scraper Type	1768 [69.61"]	1292 [50.87"]	3184 [125.35"]
Dual Belt Type	1987 [78.23"]	1177 [46.34"]	3327 [130.98"]

A = Height of Chip Conveyor
B = Height of Chip Outlet
C = Width of Coolant Tank and Chip Conveyor



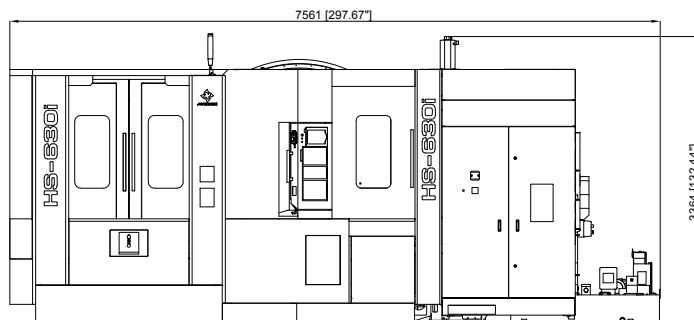
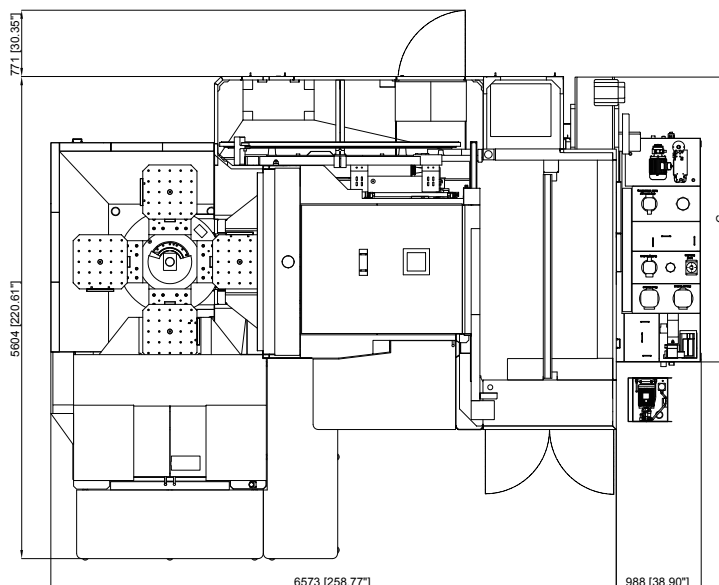
(mm[inch])

6 APC with 60 Tool ATC



Chip Conveyor Type	A (mm [inch])	B (mm [inch])	C (mm [inch])
Scraper Roller Type	1687 [66.42"]	1067 [42.01"]	3292 [129.61"]
Steel Belt Type	1547 [60.91"]	1079 [42.48"]	3331 [131.14"]
Magnetic Scraper Type	1768 [69.61"]	1292 [50.87"]	3184 [125.35"]
Dual Belt Type	1987 [78.23"]	1177 [46.34"]	3327 [130.98"]

A = Height of Chip Conveyor
B = Height of Chip Outlet
C = Width of Coolant Tank and Chip Conveyor



(mm[inch])

HS-630i with AVEREX-FANUC MPro I+ SPECIFICATIONS

	DESCRIPTIONS	IMPERIAL	METRIC
TRAVEL	X-axis, Y-axis, Z-axis	41.3", 35.4", 40.2" (10,000 rpm Spindle) 41.3", 34.6", 40.2" (8,000 rpm Spindle)	1050 mm, 900 mm, 1020 mm (10,000 min ⁻¹ Spindle) 1050 mm, 880 mm, 1020 mm (8,000 min ⁻¹ Spindle)
	Spindle center to pallet surface	3.1" - 34.6" (10,000 rpm Spindle) 3.9" - 34.6" (8,000 rpm Spindle)	80 - 980 mm (10,000 min ⁻¹ Spindle) 100 - 980 mm (8,000 min ⁻¹ Spindle)
	Spindle nose to pallet center	2.0" - 42.1"	50 - 1,070 mm
	Pallet top height (from the floor)	51.3"	1,304 mm
TABLE	Table size (2 pallets)	24.8" x 24.8"	630 mm x 630 mm
	Workpiece max. size	Ø39.4" x 51.2"	Ø1,000 mm x 1,300 mm
	Max. payload	2,640 lb	1,200 kg
	Configuration	M16x30L P=4.9"	M16x30L P=125 mm
	Min. indexing degree	1° (0.001° Optional)	1° (0.001° Optional)
	Indexing speed	2.2 sec. /90° (2.0 sec. /90° Optional)	2.2 sec. /90° (2.0 sec. /90° Optional)
	Pallet clamping system	Mechanical Lock	Mechanical Lock
	Pallet clamping force	3,590 lb x 4 cones	16 kN x 4 cones
SPINDLE	B-axis clamping torque	36,140 lb-ft (3,023 lb-ft Optional)	49,000 Nm (5,500 Nm Optional)
	Spindle speed	20-10,000 rpm (8,000 rpm Optional)	20-10,000 min ⁻¹ (8,000 min ⁻¹ Optional)
	Spindle rated torque	460 lb-ft (15%ED) 225 lb-ft (15 min.) 814 lb-ft (10%ED) (8,000 rpm Optional) 408 lb-ft (30 min.) (8,000 rpm Optional)	623 Nm (S3 15%) 305 Nm (Cont.) 1104 Nm (S3 15%) (8,000 min ⁻¹ Optional) 553 Nm (Cont.) (8,000 min ⁻¹ Optional)
	Spindle acceleration / deceleration	5.5 sec. (0-10K rpm) / 5.5 sec. (10K-0 rpm)	5.5 sec. (0-10K min ⁻¹) / 5.5 sec. (10K-0 min ⁻¹)
FEED	Spindle taper	ISO 7/24 Taper NT No. 50	ISO 7/24 Taper NT No. 50
	Through spindle coolant	435 psi	3.0 MPa
	Rapid feed (X/Y/Z)	1,969 ipm	50,000 mm/min
	Cutting feed (X/Y/Z)	0.04-1,969 ipm	1-50,000 mm/min
ATC	Table rotating speed	Parkson: 16.6 rpm (33.3 rpm Optional)	Parkson: 16.6 min ⁻¹ (33.3 min ⁻¹ Optional)
	Guide ways (X/Y/Z)	Roller ways [THK]	Roller ways [THK]
	Acceleration (X/Y/Z)	0.7 G/1.0 G/0.9 G	0.7 G/1.0 G/0.9 G
	Ballscrews size	Ø1.97"	Ø50 mm
APC	Type of tool shank	BBT 50 (CAT 50, DIN 69871-50 Optional)	BBT 50 (CAT 50, DIN 69871-50 Optional)
	Type of pull-stud	JIS 50P (CAT 50, DIN 69872-50 Optional)	JIS 50P (CAT 50, DIN 69872-50 Optional)
	Number of tools	60T (120T Optional)	60T (120T Optional)
	Max. tool diameter	Ø4.5" / Ø11.8"	Ø115 mm / Ø300 mm
	(Adjacent pots full / empty)		
	Max. tool length	23.6"	600 mm
	Max. tool weight	55 lb	25 kg
	Tool selection system	Random	Random
MOTOR	Tool to tool	2.5 sec. (3.5 : Heavy tool programmable)	2.5 sec. (3.5 : Heavy tool programmable)
	Chip to chip	5.8 sec. (6.8 : Heavy tool programmable)	5.8 sec. (6.8 : Heavy tool programmable)
	Number of pallets	2, Optional 6	2, Optional 6
	Pallet change system	Rotation	Rotation
SUPPLY	APC exchange time	15 sec.	15 sec.
	Spindle motor	60.3 / 34.9 hp (73.8 / 49.6 hp Optional)	45 / 26 kW (55 / 37 kW Optional)
	Feed axes motors (X/Y/Z/B)	7.4 / 6.7 / 7.4 / 5.4 hp	5.5 / 5.0 / 5.5 / 4.0 kW
	Lubrication pump motor	0.024 hp	18 W
TANK	Spindle coolant pump	2.2 hp	1.6 kW
	Chips flush (base) coolant pump	2.7 hp	2.0 kW
	Through spindle coolant pump	3.0 hp	2.2 kW
	Overhead shower flush coolant pump	3.0 hp	2.2 kW
SIZE	Hydraulic pump	3.0 hp	2.2 kW
	Spindle oil chiller	5.2 hp	3.9 kW
	Electric voltage	200 - 230 volt	200 - 230 volt
	Electric power supply	70 kVA	70 kVA
TANK	Air pressure	87.0 psi	0.6 MPa
	Air volume	174 gal/min	660 liter/min
	Hydraulic unit tank	15.9 gallon	60 liter
	Coolant Tank	303.8 gallon	1,150 liter
SIZE	Lubrication unit tank	0.79 gallon	3.0 liter
	Machine dimension (L x W x H)	270.7" x 161.5" x 132.4"	6,877 x 4,103 x 3,364
	Required floor space (L x W x H)	302.2" x 221.5" x 132.4"	7,677 x 5,627 x 3,364
	Machine weight	40,124 lb	18,200 kg



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