

**QUASER**

*we cut faster*

# HX SERIES

# HX SERIES



	Pallet size	Spindle taper
HX404	□ 400	BBT40
HX504	□ 500	BBT40
HX505	□ 500	BBT50
HX635	□ 630	BBT50
HX805	□ 800	BBT50

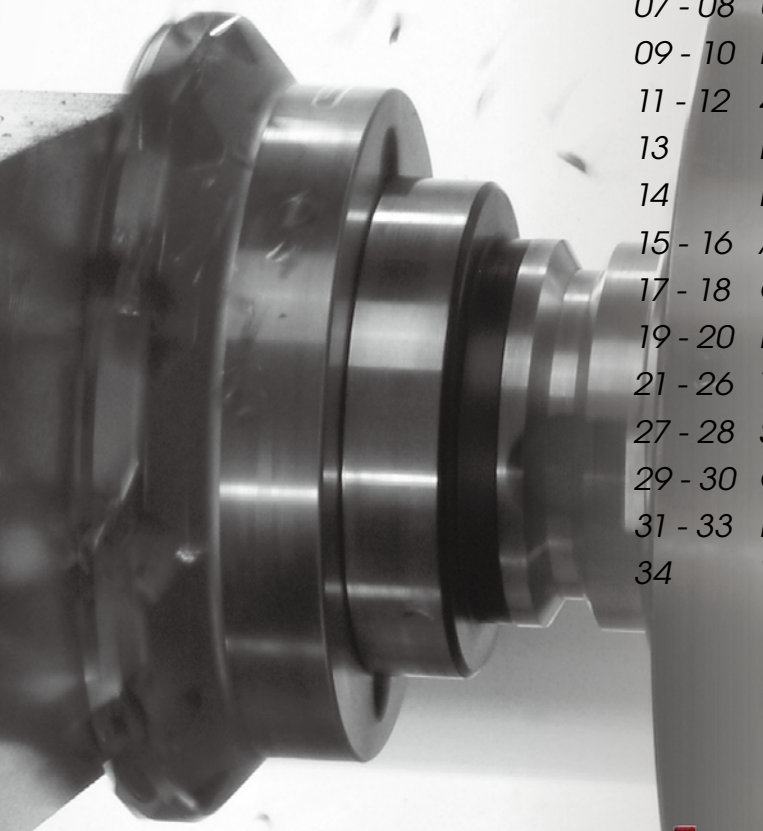


## Horizontal Machining Center



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# HX404 & HX504 & HX505



**HX404** Max. workpiece: Ø630 mm x 900 mm / 400 kg



HX404E / HX404P

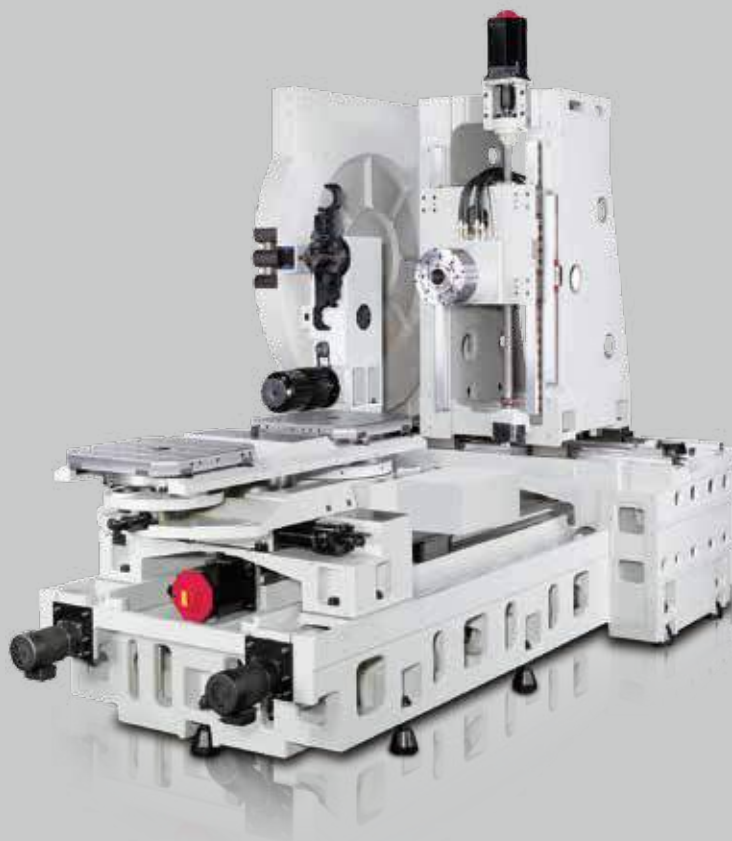
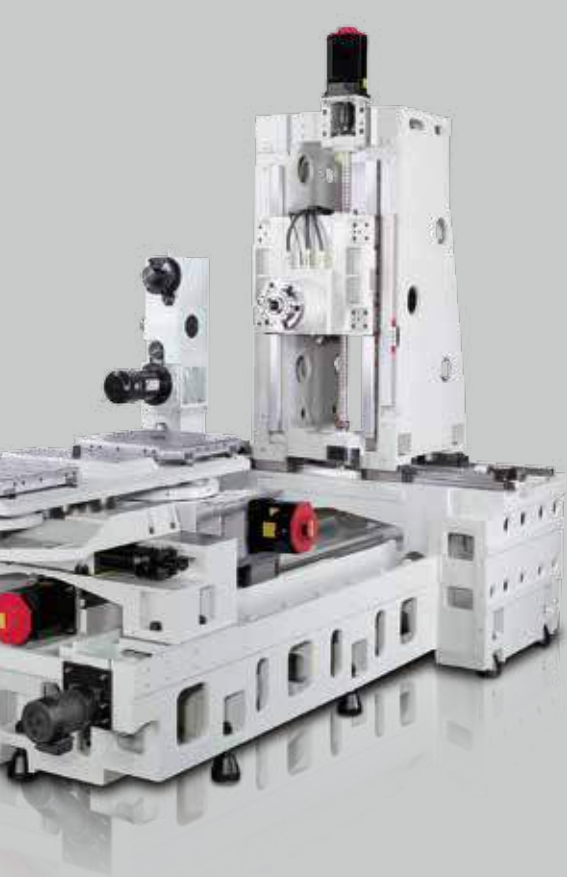


HX504C / HX505C



**HX504** Max. workpiece:  $\text{Ø}762$  mm x 900 mm / 500 kg

**HX505** Max. workpiece:  $\text{Ø}800$  mm x 900 mm / 500 kg



HX504E / HX504P

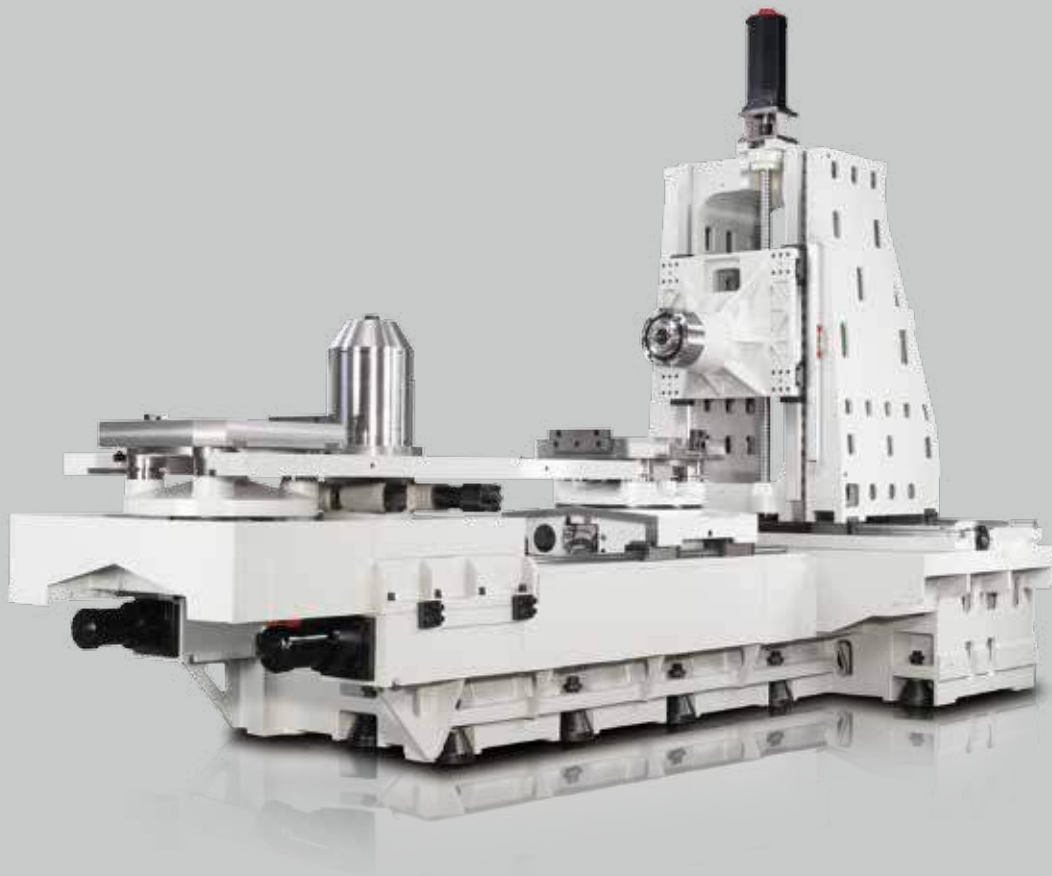


HX505E / HX505P

# HX635 & HX805

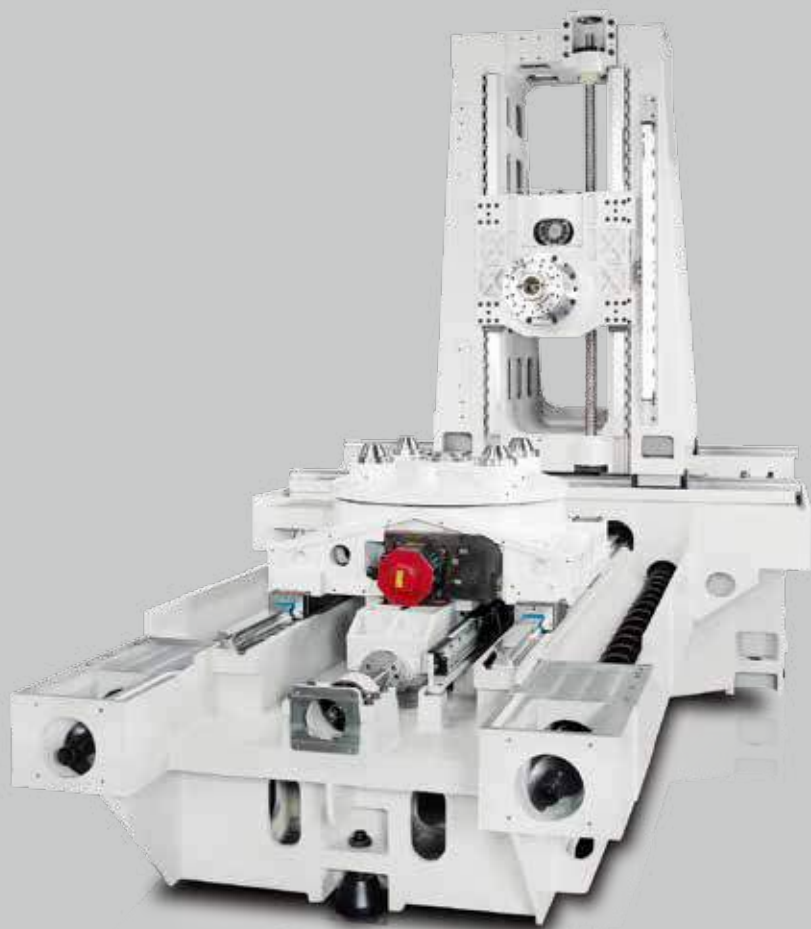


**HX635** Max. workpiece:  $\varnothing 950$  mm x 950 mm / 900 kg





**HX805** Max. workpiece:  $\varnothing$ 1,200 mm x 1,100 mm / 1,500 kg



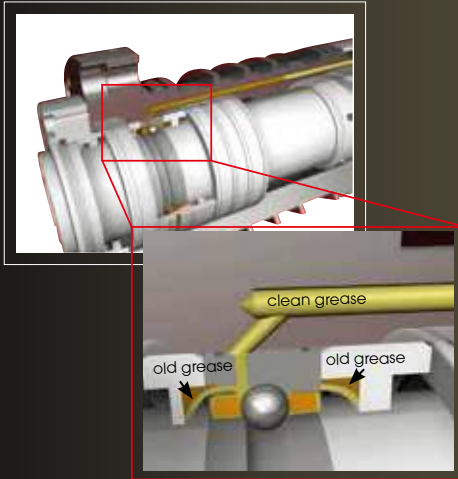
Note: Machine might be different from the photo if there is any update.

# Unique spindle technology



## Grease replenishing system

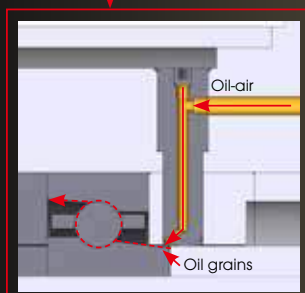
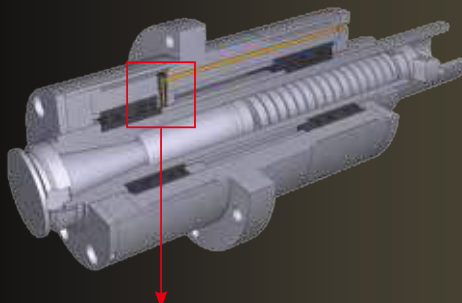
- Use car industry re-greasing principle to supply "clean grease" at 60~100 hr interval by 25~50 mm<sup>3</sup> / shoot.



- The grease volume can support 30,000 hr or 3 years.



- The lubrication concept illustration of Oil-air



## 40/50 Taper

Belt driving



FANUC = ● SIEMENS = ●

SPINDLE	SC-4.2	GC-4.0R
Max. spindle speed	12,000	15,000
Spindle transmission	Coupling	
Spindle diameter	Ø80 / Ø70	Ø70
Lubrication	Grease packed	
Bearing arrangement	<< >>	<< >>

### FANUC

Spindle base speed	1,500	1,400
Spindle output power kW (S3-25%)	15	26
Spindle output torque Nm (S3-25%)	96	177

### SIEMENS

Spindle base speed	1,500	1,500
Spindle output power kW (S6-25%)	13.3	27.7
Spindle output torque Nm (S6-25%)	85	132

### 40 Taper

HX404E	● ●	-
HX404P	-	-
HX504C	-	-
HX504E	-	-
HX504P	-	● ●

### 50 Taper

HX505C	-	-
HX505E	-	-
HX505P	-	-
HX635HS	-	-
HX635HT	-	-
HX805HS	-	-
HX805HT	-	-

Note: <sup>(1)</sup>S6-25% <sup>(2)</sup>S3-40% <sup>(3)</sup>S3-60%  
<sup>(4)</sup>Only for FANUC Control

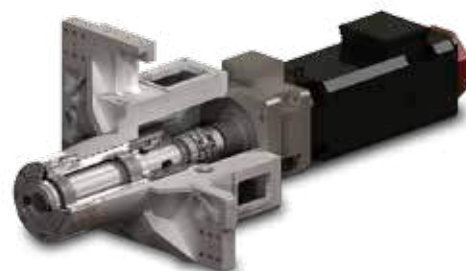
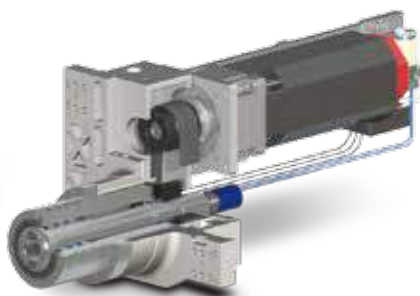
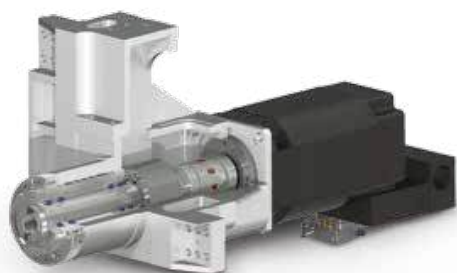




## Coupling

## Gear box + Belt driving

## Gear box + Coupling



MC-4.1R	MC4.0R <sup>(4)</sup>	SB-4.0		GB-4.1R				GB-5.0	GB-5.0R	GB-5.1R		SC-5.0	RC-5.0A		MC-5.0A
15,000	20,000	8,000	10,000	9,000	12,000	9,000	12,000	6,000	6,000	6,000	7,500	6,000	10,000		15,000
Coupling		Belt		Belt				Belt + Gear box		Coupling+ Gear box		Coupling			
Ø80	Ø70	Ø70		Ø70 / Ø65				Ø100	Ø100 / Ø90		Ø100		Ø90		
Re-grease		Grease packed		Re-grease				Grease packed	Re-grease		Grease packed	Oil-Air			
<> =		<<>>		<<>> =				<<>>	= <<> =		<<>>				

1,400	500	1,500	981	1,350	1,125	1,500	1,125	1,500	818	750	300	375	375	500	460	500
26	30 <sup>(1)</sup>	15	15	15	25	25	35	35	15	35	35	35	35	22 <sup>(3)</sup>	37 <sup>(2)</sup>	30 <sup>(1)</sup>
177	420 <sup>(1)</sup>	125	146	106	212	159	297	223	194	446	1114	891	891	353 <sup>(2)</sup>	350 <sup>(2)</sup>	420 <sup>(1)</sup>

1,500	-	1,090	1,500	-	-	1,500	2,000	818	1,000	350	437.5	500	2,000	-
27.7	-	20.9	20.9	-	-	46.5	46.5	20.9	46.5	40.9	40.9	46.5	46.5	-
132	-	183	133	-	-	296	222	244	444	1115	893	888	222	-

-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
●	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	●	●	-	-	-	-	-	-	-	-	-	-	-	-
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●	●	●	-	-	-	-	●	●	-	-	-	-	-	-	-	-

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# Direct axes transmission

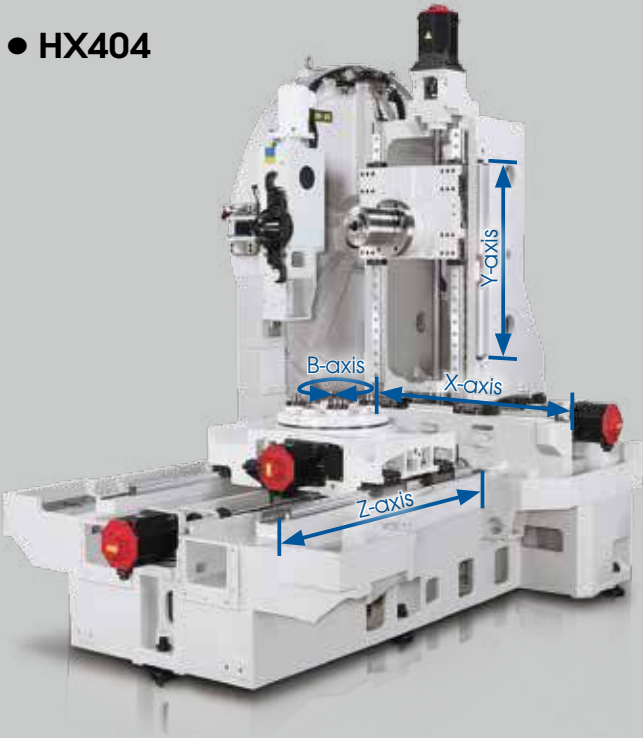
Control: (F) FANUC (S) SIEMENS

Specification code	HX404		HX504			HX505		HX635 ; HX805			
	A / B		A / B			A / B	A		A / B		
	E	P	C	E	P	C	E	P	HT	HS	
Motor X / Y / Z (KW)	F	4.5 / 4.5 / 4.5	4.5 / 5.5 / 5.5	1.8 / 3 / 1.8	3 / 4 / 3	4 / 4 / 4	1.8 / 3 / 1.8	4 / 4 / 4		7 / 6 / 7	
	S	3.1 / 3.1 / 4.9	4.9 / 4.9 / 4.9	2.7 / 3.1 / 2.7	-	4.8 / 4.4 / 4.8	2.7 / 3.1 / 2.7	-	4.8 / 4.8 / 4.8		5.37 / 5.37 / 5.37
B (KW)	F	2.7 / 4.5		2.5	3 / 4		2.5	3		3 / 4	3 / 4
	S	2.7 / 3.3		2.7	-	2.7	2.7	-	2.7	3.3	
Rapid X / Y / Z (m/min)	48	60	30	32	48	30	32		40		
Acceleration X / Y / Z (m/s <sup>2</sup> )	6 / 7 / 9	7.8 / 9.8 / 9.8	3 / 3 / 3 (F)	3 / 4 / 4 (F)	4 / 5 / 5 (F)	3 / 3 / 3 (F)	3 / 4 / 4 (F)	3 / 4 / 4 (F)	4 / 5 / 5 (F)		
	(F) (S)	(F) (S)	3 / 3 / 2 (S)		4 / 5 / 5 (S)	3 / 3 / 2 (S)		3 / 4 / 4 (S)	4 / 5 / 5 (S)		

Note: A= 1° / B=0.001°

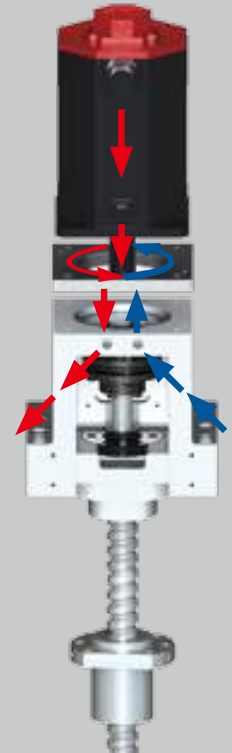
## Thermal solution for HX404

- HX404

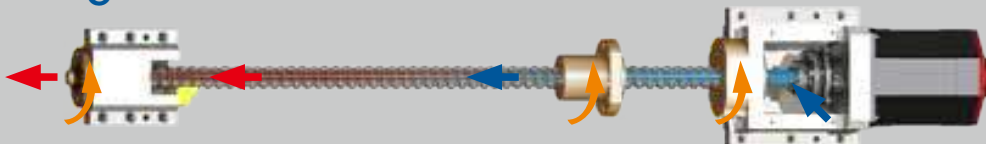


- Additional Y-axis cooling plate

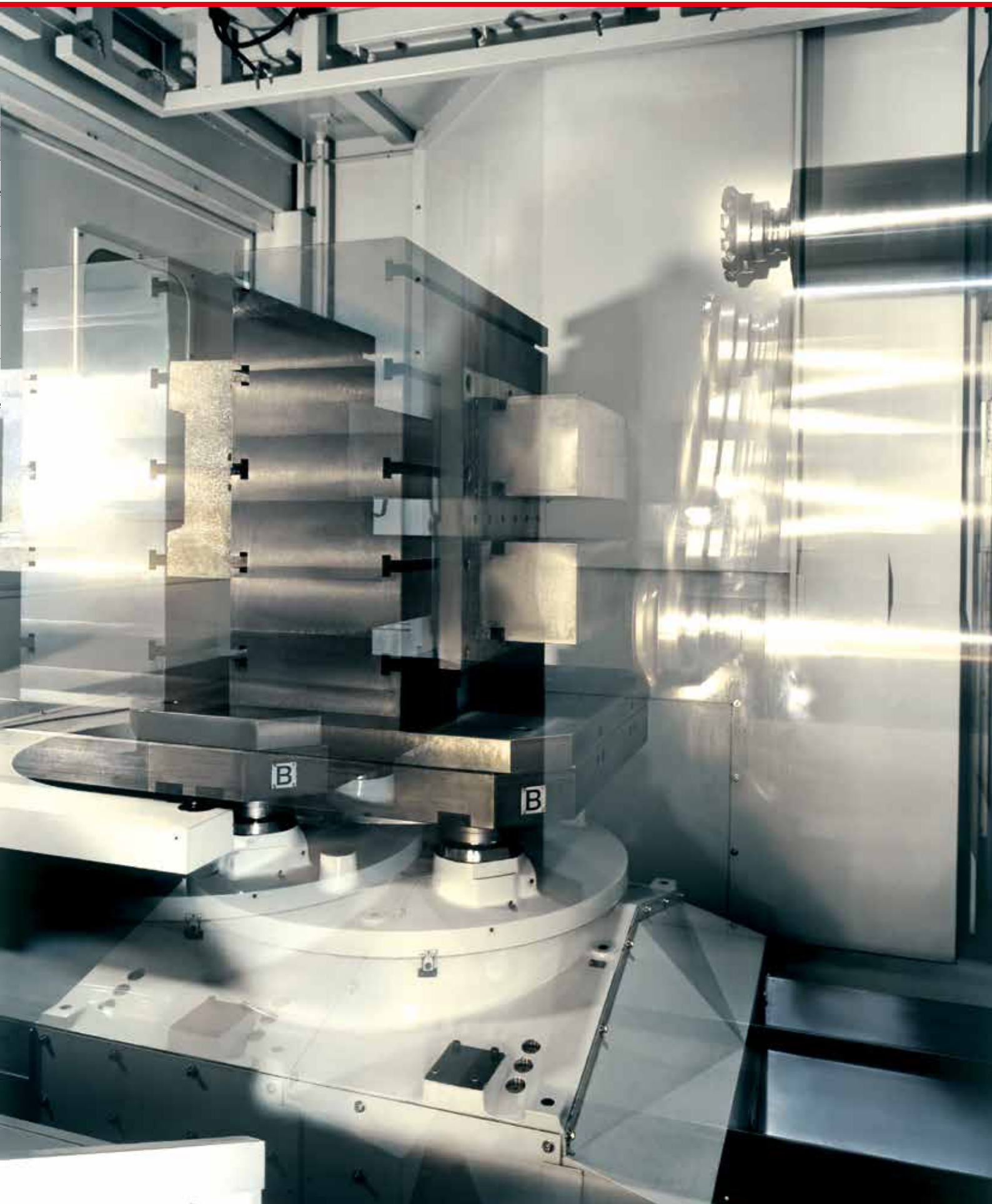
Y axis cooling plate prevents the heat produced by the motor from conducting to Y axis which may cause deformation.



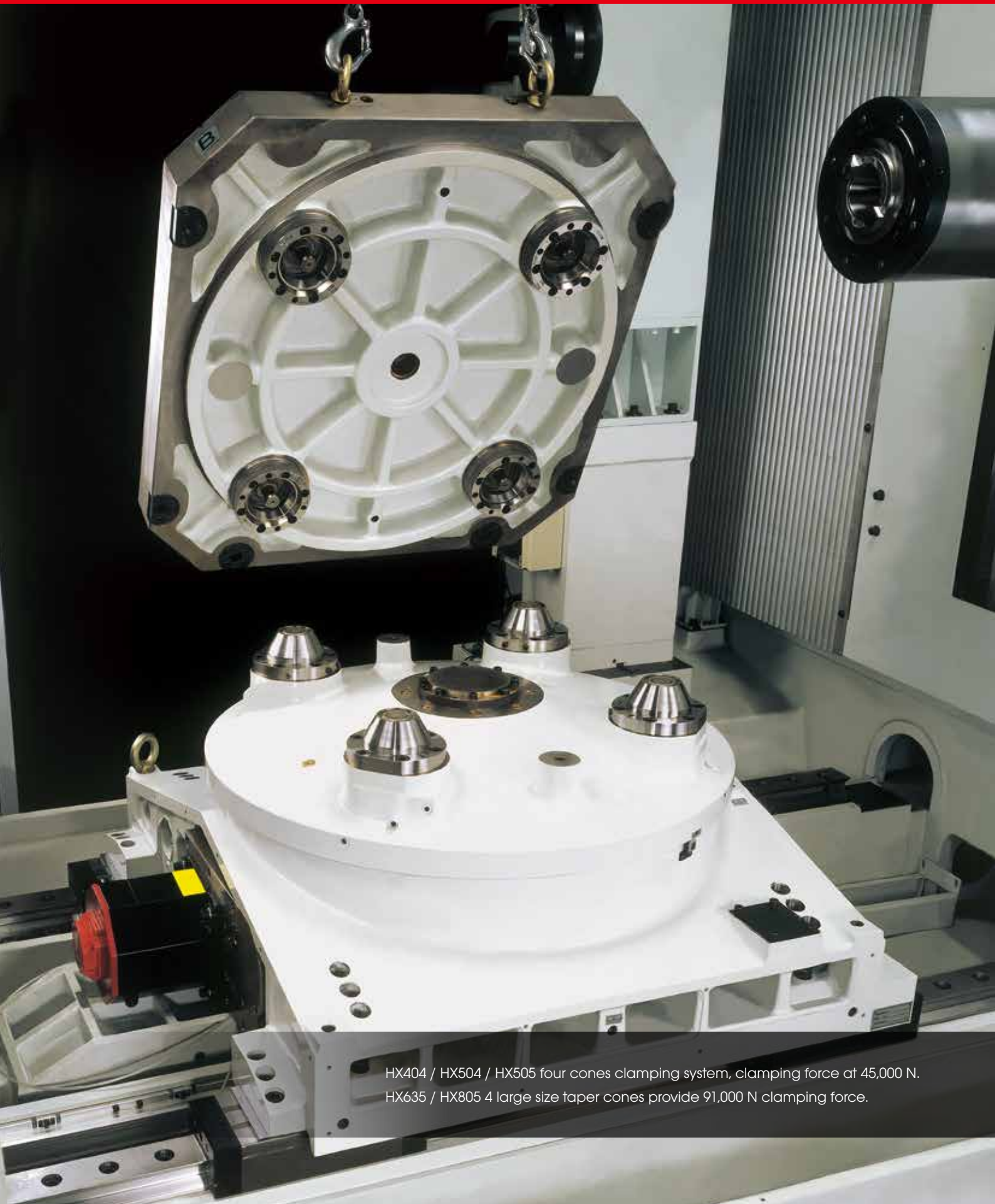
- Auto grease for 3 points
- Coolant through ballscrew\*



Note: \*Coolant through ball screw is available on HX404E/P & HX504E/P



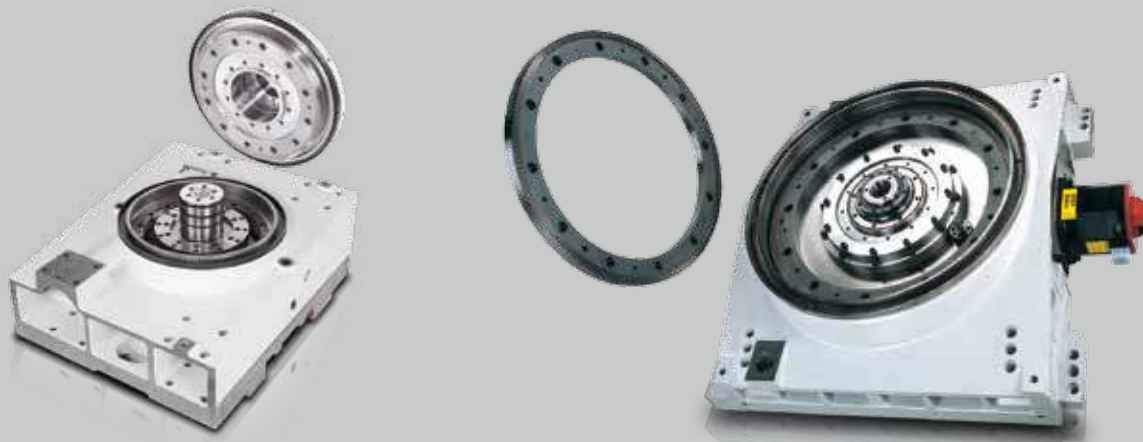
# 4<sup>th</sup> axes



HX404 / HX504 / HX505 four cones clamping system, clamping force at 45,000 N.  
HX635 / HX805 4 large size taper cones provide 91,000 N clamping force.

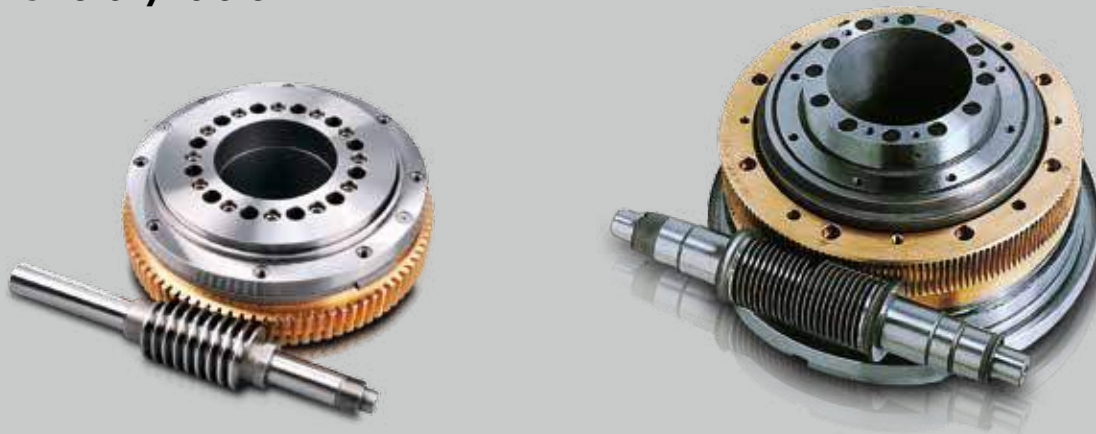


## 1° indexing table Hirth coupling



	HX404	HX504 / HX505	HX635	HX805
Pallet size	400 x 400 mm	500 x 500 mm	630 x 630 mm	800 x 800 mm
Accuracy (VDI)	8 sec	8 sec	8 sec	8 sec
Repeatability (VDI)	3 sec	3 sec	3 sec	3 sec
Large tooth coupling	Ø360	Ø360	Ø520	Ø700
Tilting moment	7,800 Nm	7,800 Nm	15,000 Nm	28,000 Nm
High clamping force	40,000 N	40,000 N	90,000 N	90,000 N

## 0.001° NC rotary table

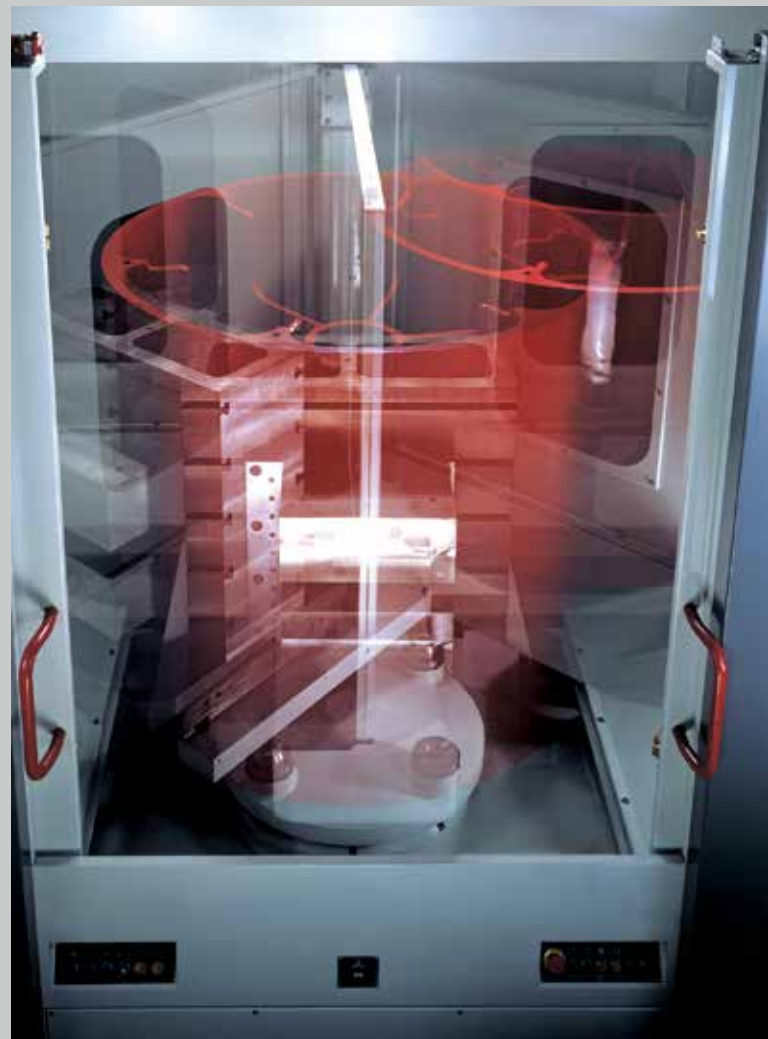


	HX404	HX504 <sup>(1)</sup>	HX635	HX805
Pallet size	400 x 400 mm	500 x 500 mm	630 x 630 mm	800 x 800 mm
Indexing accuracy (VDI)	10 sec	10 sec	10 sec	10 sec
Repeatability (VDI)	4 sec	4 sec	4 sec	4 sec
Tilting moment	4,000 Nm	4,000 Nm	9,000 Nm	19,000 Nm
High clamping force	3,200 N	3,200 N	4,100 N	5,635 N
Drive torque	2,550 Nm	2,550 Nm	2,550 Nm	3,200 Nm

Note: <sup>(1)</sup> The specification of HX505C is the same as HX504

# Pallet system

Specification code	HX404		HX504			HX505			HX635		HX805	
	E	P	C	E	P	C	E	P	HT	HS	HT	HS
APC time (sec.) at 60Hz	10.5	5.5	10.5			14			19			
Pallet load capacity (kgs / each)	400		500			900			1500			
Pallet changing repeatability (mm)	0.01											



# HX504 & HX505 Cell

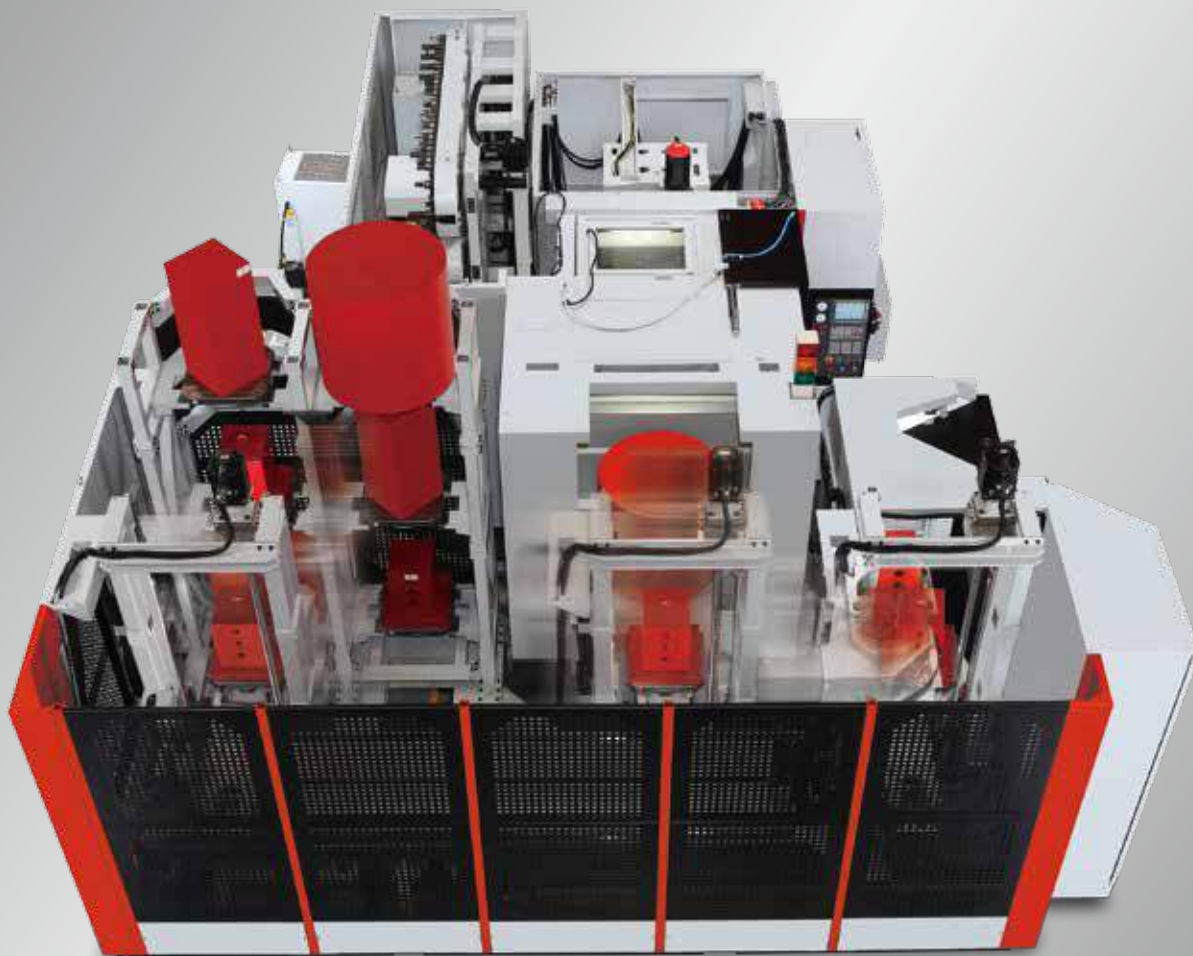


HX504: Max. ATC capacity: 240

Pallet capacity: 8 or 14

HX505: Max. ATC capacity: 150

Pallet capacity: 8 or 14



Note: Find details in Horizontal M/C Cell.

# ATC system



(D) Disk type (C) Chain type (R) Rack type

By std. magazine combination	HX404	HX504	HX504			HX505	HX505					HX635		
	A / B	A / B	A / B			A / B	A					A / B		
Specification code	E / P	C	E / P			C	E / P					HT / HS		
ATC type	ISO40						ISO50							
No. of tools	60 (D)	48/60 (C)	60 (D)	120 (C)	240 (R)	30/40 (C)	40 (D)	60 (C)	120 (C)	150 (R)	40 (D)	60 (C)	120 (C)	150 (R)
Max. tool length (mm)	350	450	450			400	400					500		
Max. tool weight (kg)	7	7	10	8	7	15	15	20	30	15	15	20	30	15

## ISO40

48/60(C)

60(D)

120(C)

240(R)



## ISO50

30/40(C)

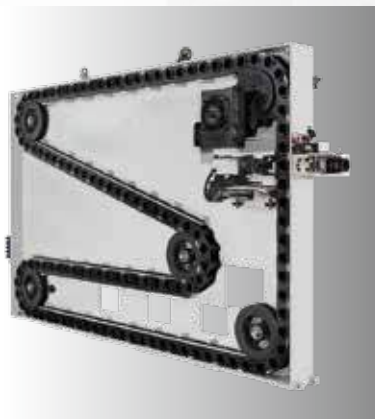
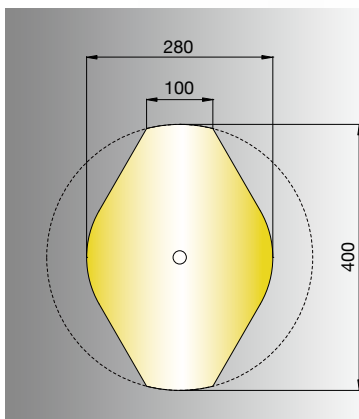
40(D)

60(C)



120(C)

150(R)



Ø400 is only applicable to special tools





HX805			By std. magazine combination	HX404		HX504			HX505			HX635		HX805		
A / B				A/B		A / B			A / B	A		A / B		A / B		
HT / HS			Specification code		E	P	C	E	P	C	E	P	HT	HS	HT	HS
			Tool to tool time (sec.) at 60Hz		1.3		2.3			3.4			3.9		3.9	
60 (C)	120 (C)	150 (R)	Chip to chip time (sec.) at 60Hz		5	4	6.6	6.4	5.7	7.7	7.3	7.9	7.9	7.9	7.9	7.9
600																
20	30	15														



# Coolant & chip management

## Total solution on coolant & chip management:

- 1 Coolant through spindle
- 2 Nozzle coolant
- 3 Wash gun
- 4 Ceiling wash down
- 5 X axis way cover
- 6 Internal chip augers
- 7 Large capacity coolant tank
- 8 External chip conveyor
- 9 W-shaped Z axis telescopic cover (HX404)

Specification code	HX404		HX504			HX505			HX635		HX805	
	E	P	C	E	P	C	E	P	HT	HS	HT	HS
Coolant tank	650 L		300 L	450 L		300 L	450 L		900 L		1,200 L	
Coolant through spindle	8 bar	20 bar	Opt.	20 bar		Opt.	20 bar		20 bar			
Nozzle coolant	3 bar								4 bar			
Ceiling wash down	3 bar		Opt.	3 bar		Opt.	3 bar		2.6 bar			
Wash gun	1.5 bar		Opt.	3 bar		Opt.	3 bar		2.6 bar			
Drum filter	Opt.		-	Opt.		-	Opt.		Opt.			

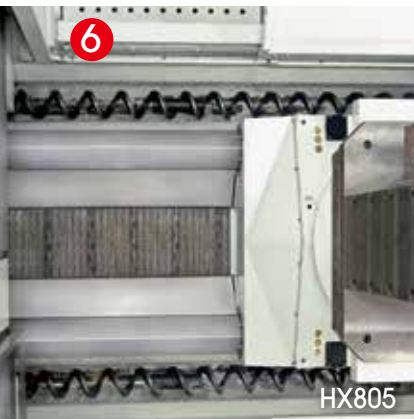




HX505



HX805



HX805



HX635

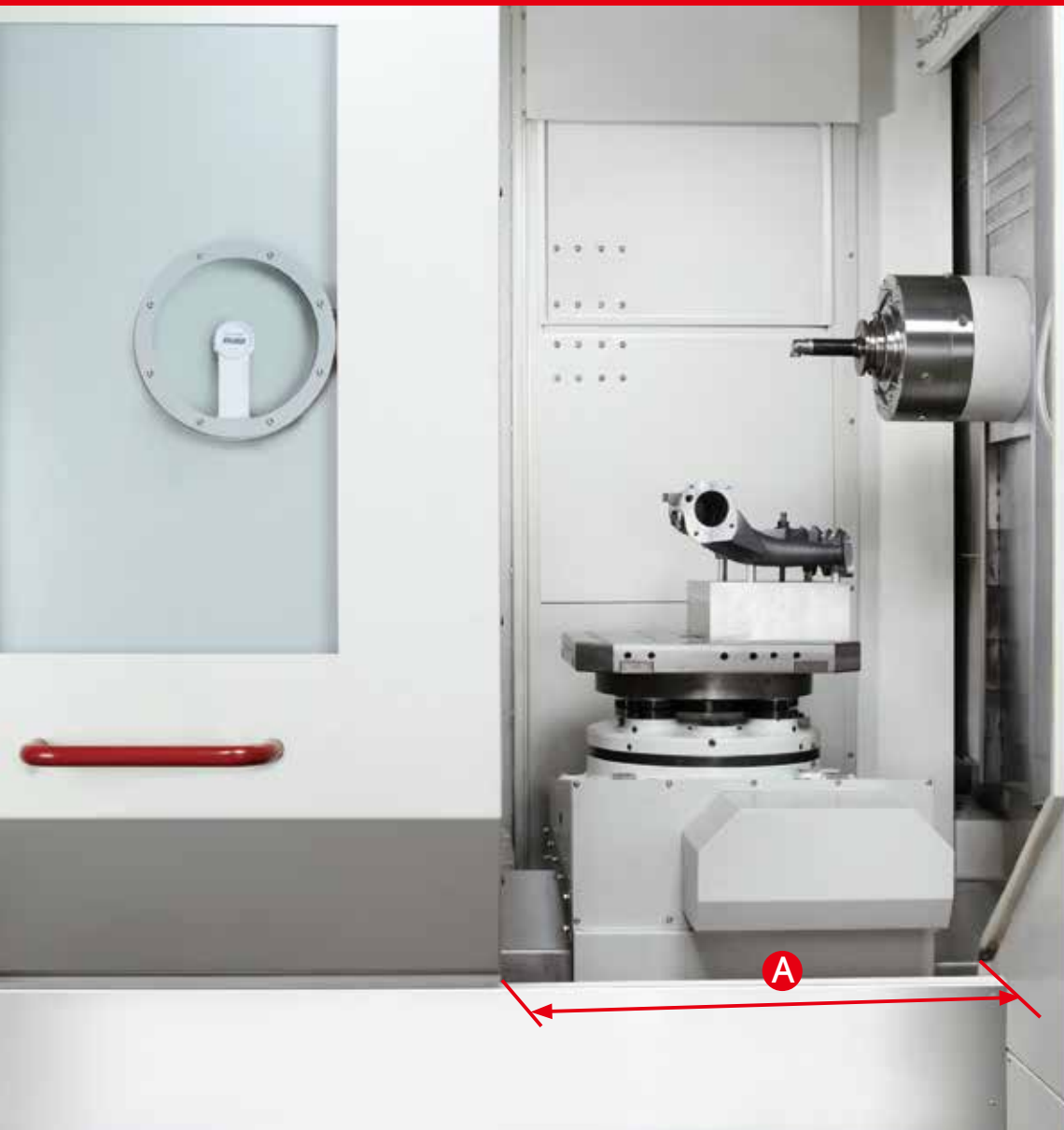


HX504/505



HX404

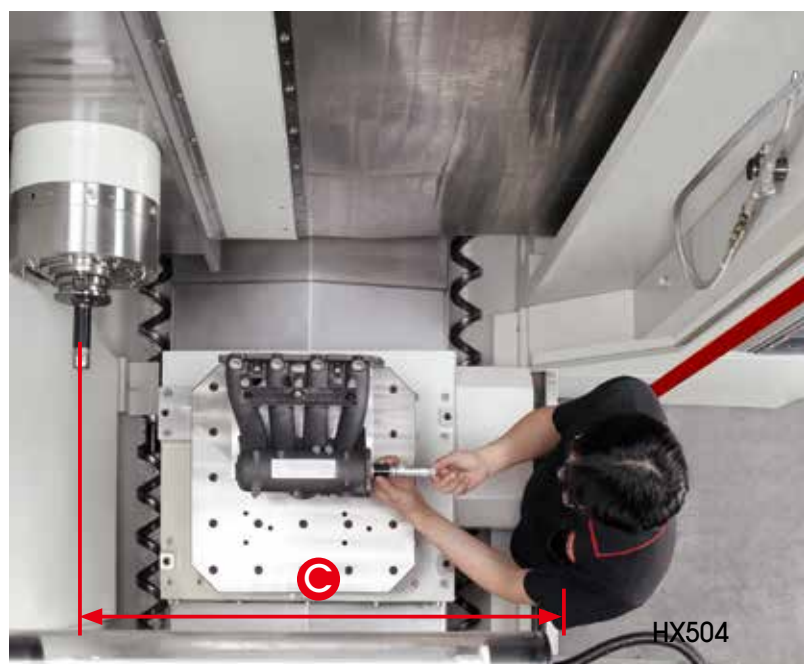
# Easy operation



HX504



HX504

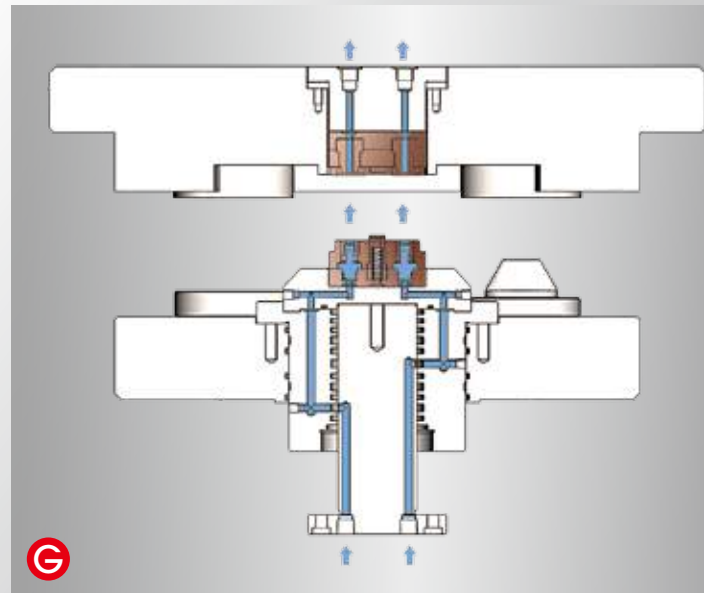


HX504



		HX404	HX504	HX505	HX635	HX805
<b>A</b>	Operator side door open	565 mm	703 mm	703 mm	745 mm	820 mm
<b>B</b>	Side door to spindle at convenient for manual tool loading / unloading from spindle spindle	220 mm	285 mm	285 mm	145 mm	268 mm
<b>C</b>	From center of table to operator door	505 mm	645 mm	645 mm	645 mm	868 mm
<b>D</b>	Tool loading / unloading on magazine side					
<b>E</b>	Easy access to maintain machine					
<b>F</b>	Swivel type operation panel <sup>(1)</sup>					
<b>G</b>	Hydraulic through pallet					

Note: <sup>(1)</sup>The remote MPG as option on C models.



Technical Data	HX404		
	A / B		
Specification code	E	P	
<b>Work range</b>			
Pallet size (mm)	□400		
Max. work swing diameter (mm)	Ø630		
Max. work piece height (mm)	900		
Table load capacity (kg)	400		
Travel X / Y / Z (mm)	560 / 640 / 640		
B minimum indexing (degree)	1 / 0.001		
Table surface to spindle center (mm)	80		
Spindle nose to table center (mm)	70		
Surface configuration	M16@pitch80 mm grid		
<b>Feed drive</b>			
Feed force X / Y / Z (N)	8,638 / 8,638 / 8,638 (F) 7,854 / 7,854 / 10,603 (S)	6,911 / 9,425 / 9,425 (F) 8,483 / 8,483 / 8,483 (S)	6,911 / 9,425 / 9,425 (F)
Rapid movement X / Y / Z (m/min) B (sec. /90 degree)	48	60	
Acceleration X / Y / Z (m/s <sup>2</sup> )	2.5 / 1.5		7.8 / 9.8 / 9.8
Dia. & pitch of the ball screw (mm)	6 / 7 / 9 Ø40 / 16	Ø40 / 20	
<b>Accuracy Positioning / Repeatability</b>			
ISO 230-2	0.008 / 0.004		
JIS 6338 (300 mm)	±0.003 / ±0.002		
VDI3441	0.008 / 0.004		
<b>Main spindle</b>			
Spindle taper	BBT40		
Max. spindle speed	12,000	15,000 (std.) <sup>(2)</sup>	20,000 (opt.) <sup>(3)</sup>
<b>Tool changer</b>			
Tool selection	Random pocket, bidirectional selection		
Magazine positions	60		
Max. tool diameter w/o adjacent tool (mm)	76.2 / 125		
Max. tool length (mm)	350		
Max. tool weight (kg)	7		
Max. tool weight moment (Nm)	10		
Tool to tool time (sec.) <sup>(1)</sup>	1.3 (< 6kg)		
Chip to chip time (sec.) <sup>(1)</sup>	5	4	
<b>Pallet changer</b>			
Number of pallet	2		
Method of pallet changer	ARM type		
Pallet change time (sec.)	10.5	5.5	
Pallet changing repeatability (mm)	0.01		
<b>Coolant system</b>			
Coolant tank capacity (Liter)	650 L		
- Nozzle coolant pump capacity <sup>(1)</sup>	60 L/min., 3.5 bar		
- Through spindle coolant pump capacity <sup>(1)</sup>	25 L/min., 8 bar	25 L/min., 20 bar	
- Ceiling & wash down pump capacity <sup>(1)</sup>	60 L/min., 3.5 bar		
<b>Machine size</b>			
Height (mm)	2,895		
Floor space W x D (mm)	2,365 x 4,915		
Weight (kg)	10,500		
<b>Connections</b>			
Main power	220 V / 60 Hz or 400 V / 50 Hz		
Power consumption (KVA)	33 (F) 34 (S)	41(F) 43 (S)	41 (F)

Note: <sup>(1)</sup>At 60 Hz <sup>(2)</sup> when MC-4.1R equipped with option item αL26 its kVA would be 52 <sup>(3)</sup>Only for FANUC Control

●=Standard ○=Option X=N/A

Standard / Option accessories	HX404			
	A	B	A	B
Specification code	E		P	
■ QUASER mill i	●	●	×	×
■ FANUC 31iB	×	×	●	●
■ SIEMENS 828D	○	○	×	×
■ SIEMENS 840D	×	×	○	○
■ Oil chiller	○	○	●	●
■ Coolant through ball screw	○	○	●	●
■ Lubrication Auto lube	●	●	×	×
■ Lubrication Auto grease	×	×	●	●
■ 40 Taper 60 position tool magazine (Random)	●	●	●	●
61 position tool magazine (Address fixed)	○	○	○	○
■ 40 Taper BT tooling (QUASER SUPPLY)	●	●	●	●
DIN tooling (69872-A) / ISO tooling (7388-B)	○	○	○	○
■ Balance tooling for spindle warm up	●	●	●	●
■ Pull stud for BT tooling	●	●	●	●
■ Air pressure detector for pallet clamping	●	●	●	●
■ Hydraulic through pallet (5 ports)*	○	○	○	○
■ 2 pallet station	●	●	●	●
■ NC rotary table (0.001° ) with rotary encoder	×	○	×	○
■ Linear encoder	○	○	○	○
■ Remote MPG	●	●	●	●
■ Transformer	●	●	●	●
■ Work probe receiver**	○	○	○	○
■ Work probe	○	○	○	○
■ Thermal compensation	○	○	○	○
■ Tool length / breakage measurement (Laser)	○	○	○	○
■ 8 bar through spindle coolant	●	●	×	×
■ 20 bar through spindle coolant	○	○	●	●
■ 50 bar through spindle coolant	○	○	○	○
■ 70 bar through spindle coolant	○	○	○	○
■ Ceiling wash down coolant	●	●	●	●
■ Coolant wash gun (Pallet loading side and machine side)	●	●	●	●
■ Internal Chip augers	●	●	●	●
■ External chip conveyor	●	●	●	●
■ Drum type conveyor	○	○	○	○
■ Bag filter	○	○	●	●
■ Oil-mist collector	○	○	○	○
■ Documentation (paper)	○	○	○	○
■ Work light	●	●	●	●
■ Machine status light	●	●	●	●
■ CE & EMC**/ GB	○	○	○	○

Note: \*Factory mounted only. \*\*Receiver OMI-2T. \*\*\*Standard for EU area.

- Machine specification might be different from the catalog if there is any specification update.

Technical Data	HX504						
	A / B						
Specification code	C		E		P		
<b>Work range</b>							
Pallet size (mm)	□500						
Max. work swing diameter (mm)	Ø762						
Max. work piece height (mm)	900						
Table load capacity (kg)	500						
Travel X / Y / Z (mm)	762 / 640 / 810						
B minimum indexing (degree)	1 / 0.001						
Table surface to spindle center (mm)	85 ~ 725 (Belt)		85 ~ 725 (Belt)		100 ~ 740 (Coupling)		
Spindle nose to table center (mm)	110 ~ 920						
Surface configuration	24-M16@ pitch100 mm grid						
<b>Feed drive</b>							
Feed force X / Y / Z (N)	6,911 / 12,566 / 6,911 (F) 7,539 / 12,566 / 7,539 (S)		6,283 / 11,519 / 6,283		8,639 / 8,639 / 8,639 (F) 10,603 / 14,137 / 10,603 (S)		
Rapid movement X / Y / Z (m/min)	30		32		48		
B (sec. /90 degree)	2.5 / 1.5						
Acceleration X / Y / Z (m/s <sup>2</sup> )	3 / 3 / 3 (F) 3 / 3 / 2 (S)		3 / 4 / 4 (F)		4 / 5 / 5 (F) (S)		
Dia. & pitch of the ball screw (mm)	Ø45 / 10		Ø45 / 12		Ø45 / 16		
<b>Accuracy Positioning / Repeatability</b>							
ISO 230-2	0.008 / 0.004						
JIS 6338 (300 mm)	±0.003 / ±0.002						
VDI3441	0.008 / 0.004						
<b>Main spindle</b>							
Spindle taper	BBT40						
Max. spindle speed	8,000	10,000	9,000	12,000	9,000	12,000	15,000*
<b>Tool changer</b>							
Tool selection	Random pocket, bidirectional selection		Random pocket, bidirectional selection (60ATC) Address fixed, random method (120 & 240ATC)				
Magazine positions	48 (std.) 60 (opt.)		60 (std.) / 120 & 240 (opt.)				
Max. tool diameter w/o adjacent tool (mm)	Ø76.2 / Ø125		Ø76.2 / Ø150 (60 & 240ATC) Ø95 / Ø190 (120ATC)				
Max. tool length (mm)	450						
Max. tool weight (kg)	7		10 (60ATC) 7 (240ATC) 8 (120ATC)				
Max. tool weight moment <from spindle gauge line> (Nm)	10		10 (60 & 120 & 240 ATC)				
Tool to tool time (sec.) <sup>(1)</sup>	2.3		2.3				
Chip to chip time (sec.) <sup>(1)</sup>	6.6		6.4		5.7		
<b>Pallet changer</b>							
Number of pallet	2						
Method of pallet changer	ARM type						
Pallet change time (sec.)	10.5						
Pallet changing repeatability (mm)	0.01						
<b>Coolant system</b>							
Coolant tank capacity (Liter) <sup>(1)</sup>	300 L		450 L				
- Nozzle coolant pump capacity	75 L / min, 3 bar						
- Through spindle coolant pump capacity	opt.		25 L / min, 20 bar				
- Ceiling & wash down pump capacity	opt.		75 L / min, 3 bar				
<b>Machine size</b>							
Height (mm)	3,030						
Floor space W x D (mm)	3,040 x 4,835		3,450 x 4,280 (60ATC) 3,620 x 4,800 (120ATC) 3,930 x 5,400 (240ATC)				
Weight (kg)	12,000		13,000 (60ATC) 16,000 (120ATC) 18,000 (240ATC)				
<b>Connections</b>							
Main power	220 V / 60 Hz or 400 V / 50 Hz						
Power consumption (KVA)	27 (F) 28 (S)		37 (F)		45 (F) 44 (S)		39 (F) 53 (S)

Note: \* when MC-4.1R equipped with option item αL26 its KVA would be 49



Technical Data	HX505				
	A / B				
Specification code	C	E	P		
<b>Work range</b>					
Pallet size (mm)	□500				
Max. work swing diameter (mm)	Ø800				
Max. work piece height (mm)	900				
Table load capacity (kg)	500				
Travel X / Y / Z (mm)	762 / 640 / 800				
B minimum indexing (degree)	1 / 0.001		1		
Table surface to spindle center (mm)	85 ~ 725				
Spindle nose to table center (mm)	115 ~ 915				
Surface configuration	24-M16@ pitch100 mm grid				
<b>Feed drive</b>					
Feed force X / Y / Z (N)	6,911 / 12,566 / 6,911 (F) 7,539 / 12,566 / 7,539 (S)		11,519 / 11,519 / 11,519		11,519 / 11,519 / 11,519 (F) 14,137 / 18,849 / 14,137 (S)
Rapid movement X / Y / Z (m/min)	30		32		
B (sec. /90 degree)	2.5 / 1.5		2.5		
Acceleration X / Y / Z (m/s <sup>2</sup> )	3 / 3 / 3 (F) 3 / 3 / 2 (S)		3 / 4 / 4 (F)		3 / 4 / 4 (F) (S)
Dia. & pitch of the ball screw (mm)	Ø45 / 10		Ø45 / 12		
<b>Accuracy Positioning / Repeatability</b>					
ISO 230-2	0.008 / 0.004				
JIS 6338 (300 mm)	±0.003 / ±0.002				
VDI3441	0.008 / 0.004				
<b>Main spindle</b>					
Spindle taper	BBT50				
Max. spindle speed	6,000	6,000	10,000	6,000	10,000
<b>Tool changer</b>					
Tool selection	Random pocket, bidirectional selection		Random pocket, bidirectional selection (40 ATC) Address fixed, random method (60 & 120 & 150ATC)		
Magazine positions	30 (std.) / 40(opt.)		40 (std.) / 60 & 120 & 150 (opt.)		
Max. tool diameter w/o adjacent tool (mm)	Ø125 / Ø200		Ø110 / Ø220 (40 & 60 & 150ATC) Ø125 / Ø400 <sup>(2)</sup> (120ATC)		
Max. tool length (mm)	400				
Max. tool weight (kg)	15	15 (40 & 150ATC)	20 (60ATC)	30 (120ATC)	
Max. tool weight moment <from spindle gauge line> (Nm)	25	30 (40 & 60ATC)	25 (150ATC)	50 (120ATC)	
Tool to tool time (sec.) <sup>(1)</sup>	3.4		3.4		
Chip to chip time (sec.) <sup>(1)</sup>	7.7		7.3		
<b>Pallet changer</b>					
Number of pallet	2				
Method of pallet changer	ARM type				
Pallet change time (sec.)	10.5				
Pallet changing repeatability (mm)	0.01				
<b>Coolant system</b>					
Coolant tank capacity (Liter) <sup>(1)</sup>	300 L		450 L		
- Nozzle coolant pump capacity	75 L / min, 3 bar				
- Through spindle coolant pump capacity	opt.		25 L / min, 20 bar		
- Ceiling & wash down pump capacity	opt.		75 L / min, 3 bar		
<b>Machine size</b>					
Height (mm)	3,030				
Floor space W x D (mm)	3,040 x 4,833 (30 ATC) 3,040 x 5,190 (40 ATC)		3,450 x 4,280 (40ATC) 3,620 x 4,800 (60ATC) 3,620 x 6,750 (120ATC) 4,300 x 6,630 (150ATC)		
Weight (kg)	13,000	13,500 (40ATC)	15,500 (60ATC)	17,000 (120ATC)	18,500 (150ATC)
<b>Connections</b>					
Main power	220 V / 60 Hz or 400 V / 50 Hz				
Power consumption (KVA)	27 (F) 28 (S)	44 (F)	48 (F)	44 (F) 44 (S)	48 (F) 53 (S)

Note: <sup>(1)</sup> At 60Hz. <sup>(2)</sup> Ø250 is standard max. tool diameter, 400 is only applicable to special tools. (please refer to page 15)

Technical Data	HX635			
	A		B	
Specification code	HT	HS	HT	HS
<b>Work range</b>				
Pallet size (mm)	□630			
Max. work swing diameter (mm)	Ø950			
Max. work piece height (mm)	950			
Table load capacity (kg)	900			
Travel X / Y / Z (mm)	1,000 / 800 / 900			
B minimum indexing (degree)	1		0.001	
Table surface to spindle center (mm)	50 ~ 850			
Spindle nose to table center (mm)	150 ~ 1,050			
Surface configuration	24-M16 Tapped holes; pitch: 125			
<b>Feed drive</b>				
Feed force X / Y / Z (N)	11,780 / 14,920 / 11,780 (F) 14,137 / 18,850 / 14,137 (S)			
Rapid movement X / Y / Z (m/min)	40			
B (sec. /90 degree)	2.5		2	
Acceleration X / Y / Z (m/s <sup>2</sup> )	4 / 5 / 5 (F) (S)			
Dia. & pitch of the ball screw (mm)	Ø50 x 16			
<b>Accuracy Positioning / Repeatability</b>				
ISO 230-2	0.008 / 0.004			
JIS 6338 (300 mm)	±0.003 / ±0.002			
VDI3441	0.008 / 0.004			
<b>Main spindle</b>				
Spindle taper	BBT50			
Max. spindle speed	6,000	10,000	6,000	10,000
<b>Tool changer</b>				
Tool selection	Random pocket, bidirectional selection (40ATC) Address fixed, random method (60 & 120 & 150ATC)			
Magazine positions	40 (std.) / 60 & 120 & 150 (opt.)			
Max. tool diameter w/o adjacent tool (mm)	Ø110 / Ø220 (40ATC) Ø125 / Ø230 (60 & 150ATC) Ø125 / Ø400 <sup>(2)</sup> (120ATC)			
Max. tool length (mm)	500			
Max. tool weight (kg)	15 (40 & 150ATC) 20 (60ATC) 30 (120ATC)			
Max. tool weight moment <from spindle gauge line> (Nm)	30 (40 & 60ATC) 25 (150ATC) 50 (120ATC)			
Tool to tool time (sec.) <sup>(1)</sup>	3.9			
Chip to chip time (sec.) <sup>(1)</sup>	7.9			
<b>Pallet changer</b>				
Number of pallet	2			
Method of pallet changer	ARM type			
Pallet change time (sec.)	14			
Pallet changing repeatability (mm)	0.01			
<b>Coolant system</b>				
Coolant tank capacity (Liter) <sup>(1)</sup>	900 L			
- Nozzle coolant pump capacity	60 L / min, 4 bar			
- Through spindle coolant pump capacity	25 L / min, 20 bar			
- Ceiling & wash down pump capacity	100 L / min, 2.6 bar			
<b>Machine size</b>				
Height (mm)	3,006			
Floor space W x D (mm)	4,225 x 6,730 (40ATC) 4,280 x 5,660 (60ATC) 4,280 x 7,550 (120ATC) 4,905 x 7,220 (150ATC)			
Weight (kg)	19,600 (40ATC) 20,500 (60ATC) 22,500 (120ATC) 23,600 (150ATC)			
<b>Connections</b>				
Main power	220 V / 60 Hz or 400 V / 50 Hz			
Power consumption (KVA)	48 (F) 47 (S)	51 (F) 47 (S)	48 (F) 47 (S)	52 (F) 47 (S)

Technical Data	HX805							
	A				B			
Specification code	HT		HS		HT		HS	
<b>Work range</b>								
Pallet size (mm)	□800							
Max. work swing diameter (mm)	Ø1,200							
Max. work piece height (mm)	1,100							
Table load capacity (kg)	1,500							
Travel X / Y / Z (mm)	1,200 / 1,000 / 1,000							
B minimum indexing (degree)	1				0.001			
Table surface to spindle center (mm)	30 ~ 1,030							
Spindle nose to table center (mm)	100 ~ 1,100							
Surface configuration	24-M16 Tapped holes; pitch: 160							
<b>Feed drive</b>								
Feed force X / Y / Z (N)	11,780 / 14,920 / 11,780 (F)				14,137 / 18,850 / 14,137 (S)			
Rapid movement X / Y / Z (m/min)	40							
B (sec. /90 degree)	3				2.1			
Acceleration X / Y / Z (m/s <sup>2</sup> )	4 / 5 / 5 (F) (S)							
Dia. & pitch of the ball screw (mm)	Ø50 x 16							
<b>Accuracy Positioning / Repeatability</b>								
ISO 230-2	0.008 / 0.004							
JIS 6338 (300 mm)	±0.003 / ±0.002							
VDI3441	0.008 / 0.004							
<b>Main spindle</b>								
Spindle taper	BBT50							
Max. spindle speed	6,000	7,500 (opt.)	10,000	15,000	6,000	7,500 (opt.)	10,000	15,000
<b>Tool changer</b>								
Tool selection	Address fixed, random method							
Magazine positions	60 (std.) 120 & 150 (opt.)							
Max. tool diameter w/o adjacent tool (mm)	Ø125 / Ø230 (60 & 150ATC) Ø125 / Ø400 <sup>(3)</sup> (120ATC)							
Max. tool length (mm)	600							
Max. tool weight (kg)	20 (60ATC)		30 (120ATC)		15 (150ATC)			
Max. tool weight moment <from spindle gauge line> (Nm)	30 (60ATC)		50 (120ATC)		25 (150ATC)			
Tool to tool time (sec.) <sup>(1)</sup>	3.9							
Chip to chip time (sec.) <sup>(1)</sup>	7.9							
<b>Pallet changer</b>								
Number of pallet	2							
Method of pallet changer	ARM type							
Pallet change time (sec.)	19							
Pallet changing repeatability (mm)	0.01							
<b>Coolant system</b>								
Coolant tank capacity (Liter) <sup>(1)</sup>	1,200 L							
- Nozzle coolant pump capacity	60 L / min, 4 bar							
- Through spindle coolant pump capacity	25 L / min, 20 bar							
- Ceiling & wash down pump capacity	100 L / min, 2.6 bar							
<b>Machine size</b>								
Height (mm)	3,658							
Floor space W x D (mm)	4,800 x 7,220 (60ATC)		4,860 x 7,850 (120ATC)		5,350 x 7,570 (150ATC)			
Weight (kg)	25,000 (60ATC)		27,000 (120ATC)		30,500 (150ATC)			
<b>Connections</b>								
Main power	220 V / 60 Hz or 400 V / 50 Hz							
Power consumption (KVA)	50 (F) 59 (S)		53 (F) 59 (S)		50 (F) 59 (S)		54 (F) 59 (S)	

Note: <sup>(1)</sup> At 60Hz <sup>(2)</sup> Ø280 is standard max. tool diameter, 400 is only applicable to special tools. (please refer to page 15)

<sup>(3)</sup> Ø250 is standard max. tool diameter, 400 is only applicable to special tools. (please refer to page 15)

●=Standard ○=Option ×=N/A

Standard / Option accessories	HX504					
	AC	BC	AE	BE	AP	BP
Specification code						
■ QUASER mill i	●	●	●	●	×	×
■ FANUC 31iB	×	×	×	×	●	●
■ SIEMENS 828D	○	○	×	×	×	×
■ SIEMENS 840D	×	×	×	×	○	○
■ ECO cooler	●	●	×	×	×	×
■ Oil chiller	○	○	●	●	●	●
■ Coolant through ball screw	×	×	●	●	●	●
■ BT tooling (QUASER SUPPLY)	●	●	●	●	●	●
DIN tooling (69872-A) / ISO tooling (7388-B)	○	○	○	○	○	○
■ ISO 40 48 position tool magazine (Chain type)	●	●	×	×	×	×
60 position tool magazine (Chain type)	○	○	×	×	×	×
60 position tool magazine (Disk type)	×	×	●	●	●	●
120 position tool magazine (Chain type)	×	×	○	○	○	○
240 position tool magazine (Rack type)	×	×	○	○	○	○
■ ISO 50 30 position tool magazine (Chain type)	×	×	×	×	×	×
40 position tool magazine (Chain type)	×	×	×	×	×	×
40 position tool magazine (Disk type)	×	×	×	×	×	×
60 position tool magazine (Chain type)	×	×	×	×	×	×
120 position tool magazine (Chain type)	×	×	×	×	×	×
150 position tool magazine (Rack type)	×	×	×	×	×	×
■ Balance tooling for spindle warm up	○	○	●	●	●	●
■ Pull stud for BT tooling	○	○	●	●	●	●
■ Air pressure detector for pallet clamping	○	○	●	●	●	●
■ Hydraulic through pallet (5 ports) <sup>(4)</sup>	○	○	○	○	○	○
■ 2 pallet station	●	●	●	●	●	●
■ NC rotary table (0.001°) with rotary encoder	×	○	×	○	×	○
■ Linear encoder	○	○	○	○	○	○
■ Panel MPG	●	●	×	×	×	×
■ Remote MPG	○	○	●	●	●	●
■ Work probe receive <sup>(3)</sup>	○	○	○	○	○	○
■ Transformer	○	○	●	●	●	●
■ Work probe	○	○	○	○	○	○
■ Thermal compensation	○	○	○	○	○	○
■ Tool length / breakage measurement (Laser) <sup>(2)</sup>	○	○	○	○	○	○
■ 20 bar through spindle coolant	○	○	●	●	●	●
■ 50 bar through spindle coolant	○	○	○	○	○	○
■ 70 bar through spindle coolant	×	×	○	○	○	○
■ Ceiling wash down coolant	○	○	●	●	●	●
■ Base, wash down coolant	×	×	×	×	×	×
■ Coolant wash gun	○	○	●	●	●	●
■ Internal Chip augers	●	●	●	●	●	●
■ Internal Chip conveyor	×	×	×	×	×	×
■ External Chip auger	●	●	×	×	×	×
■ External chip conveyor	○	○	●	●	●	●
■ Drum type conveyor	○	○	○	○	○	○
■ Bag filter	○	○	○	○	○	○
■ Oil-mist collector	○	○	○	○	○	○
■ Documentation	○	○	○	○	○	○
■ Work light	●	●	●	●	●	●
■ Machine status light	●	●	●	●	●	●
■ CE & EMC <sup>(1)</sup> / GB	○	○	○	○	○	○

Note: <sup>(1)</sup>Standard for EU area except C type.

<sup>(2)</sup>HX504 / 505 / 635 / 805 only available for NC4S Renishaw. <sup>(3)</sup>Receiver OMI-2T. <sup>(4)</sup>Factory mounted only.

- For C series ambient temperature greater than 35°C the cabinet heat exchanger is required.

27 - Machine specification might be different from the catalog if there is any specification update.

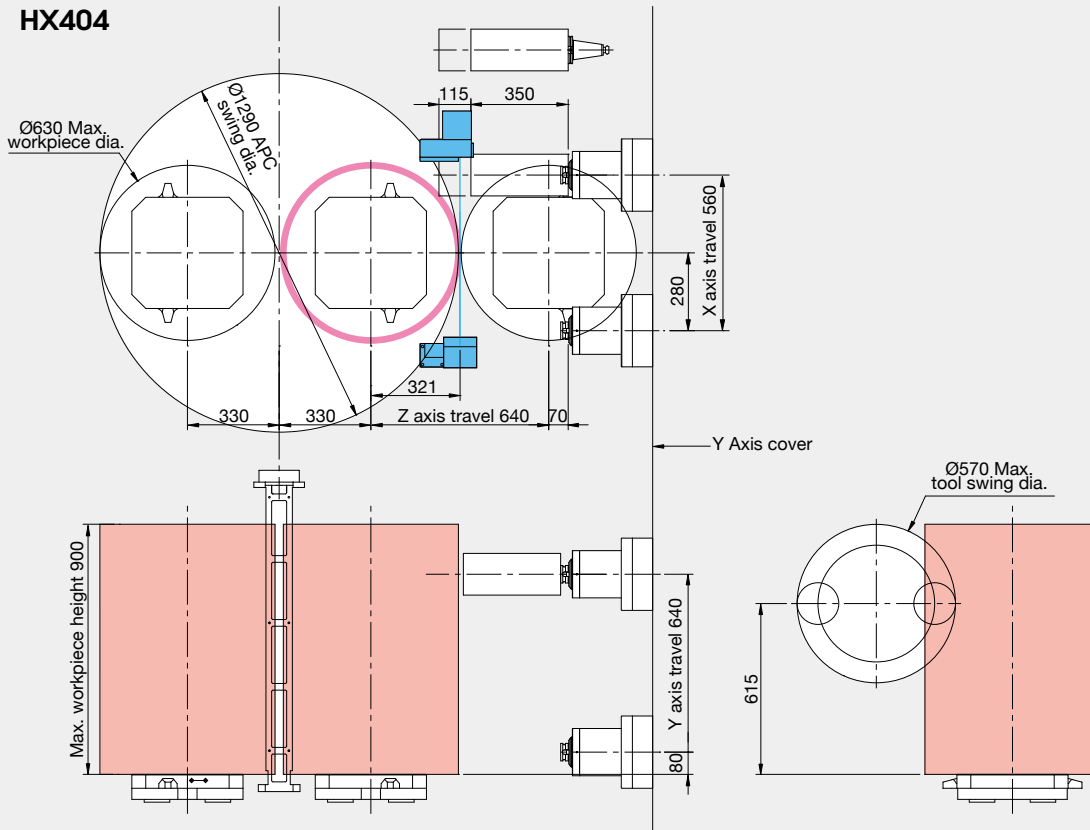


# Cutting area interference

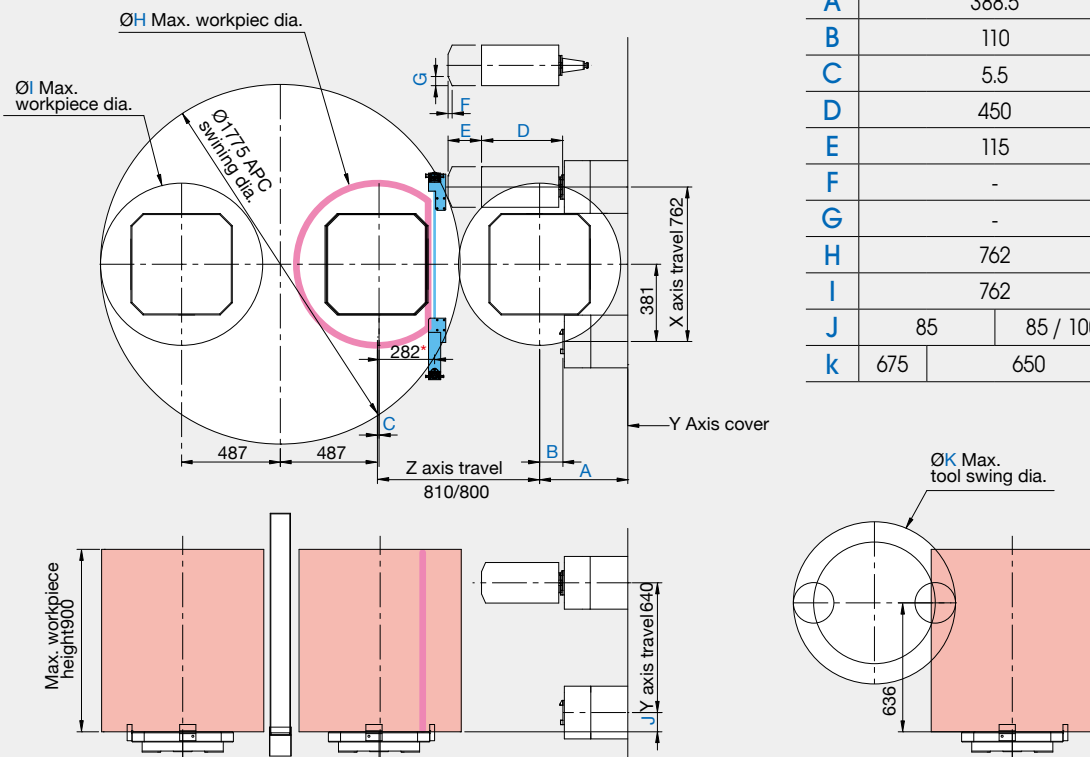


## Cutting area interference

### HX404



### HX504 / HX505



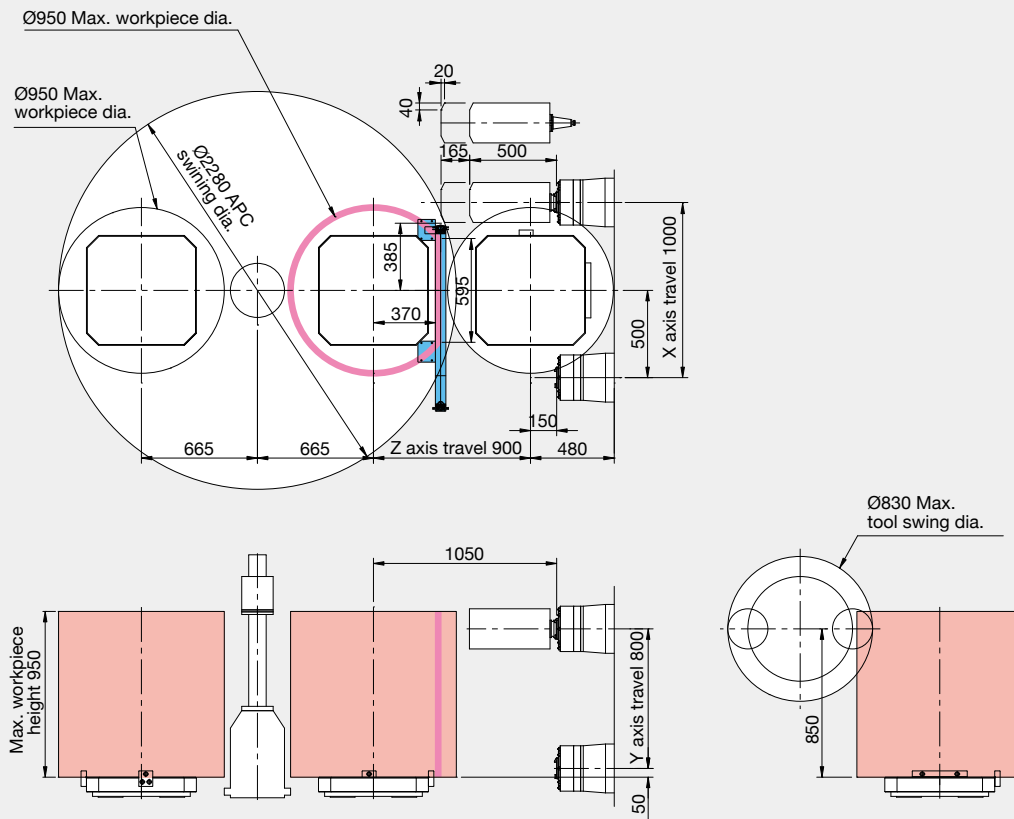
	HX504		HX505		
	C	E	C	E	P
	Belt		Belt / Coupling		
A	388.5		435		
B	110		115		
C	5.5		8		
D	450		400		
E	115		165		
F	-		20		
G	-		45	55	
H	762		800		
I	762		800		
J	85	85 / 100	85	85 / 85	
k	675	650	800	770	

Note: \*Maximum workpiece swing may impact "TOOL LENGTH MEASUREMENT" functionally.

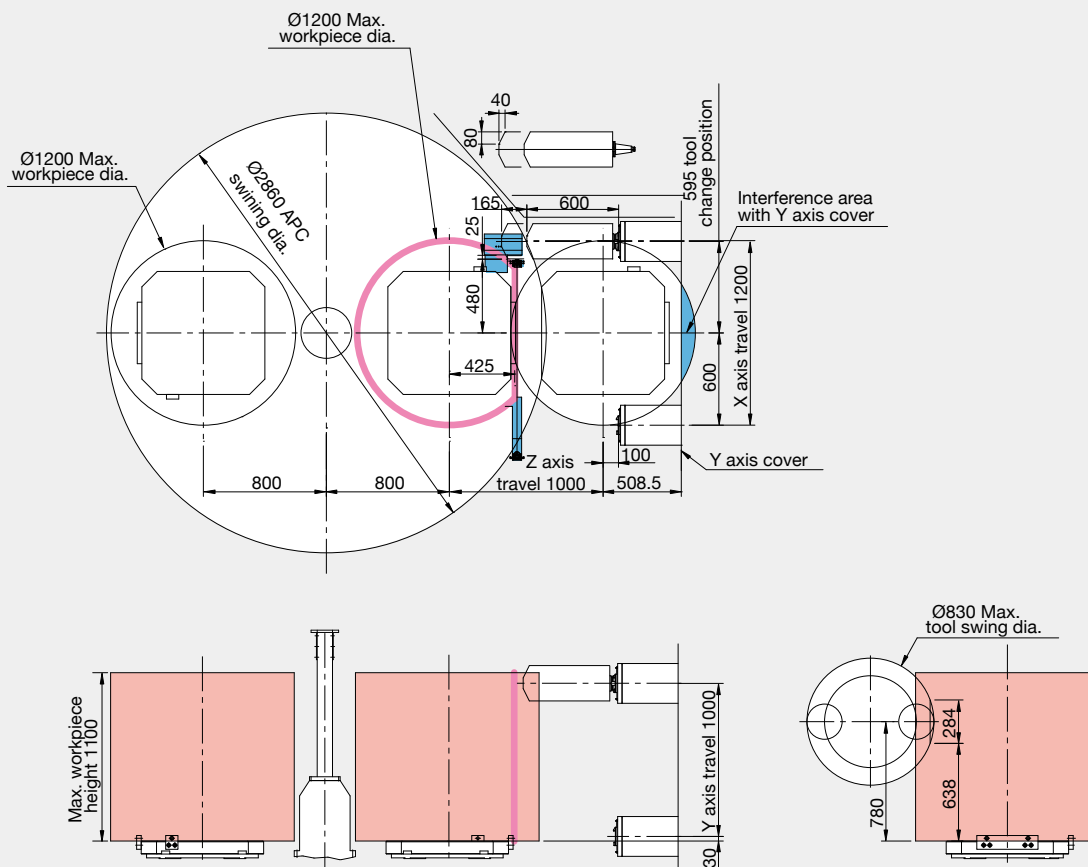


## Cutting area interference

### HX635



### HX805

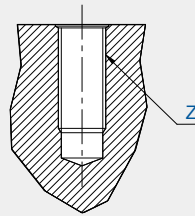
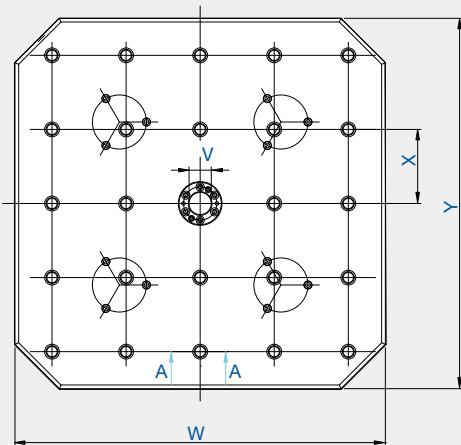


# Machine Dimensions

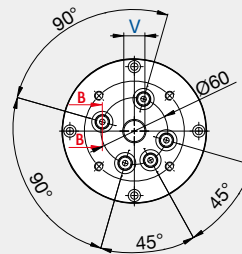


## Pallet dimension

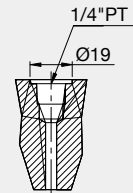
	HX404	HX504/HX505/8APC	HX635	HX805	Fixture hydraulic
V	$\varnothing 50^{+0.016}_0 \times D32$	$\varnothing 50^{+0.016}_0 \times D32$	$\varnothing 30^{+0.02}_0 \times D15$		$\varnothing 19^{+0.016}_0 \times D25$
W	400	500	630	800	500
X	80	100	125	160	100
Y	400	500	630	800	500
Z	24-M16				



A-A SECTION



Fixture hydraulic

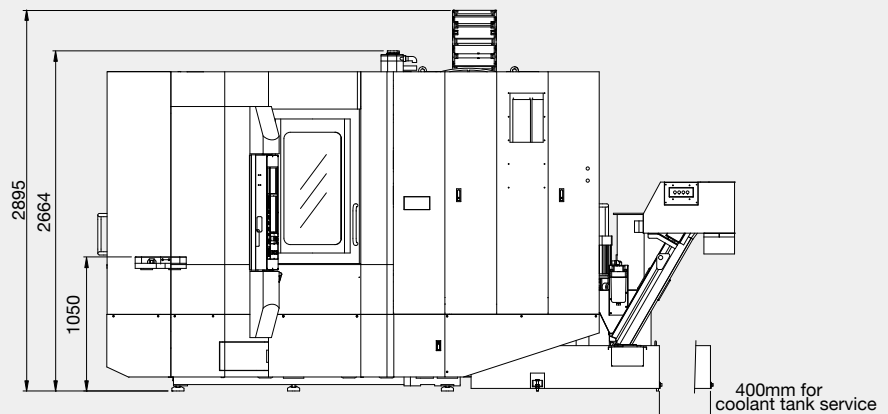
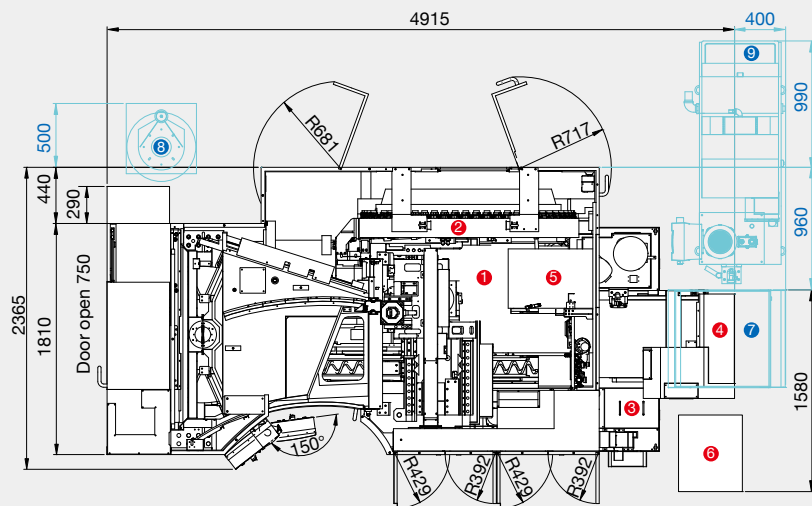


B-B SECTION

## Installation dimension

### HX404

- 1 Standard Machine
- 2 Magazine unit
- 3 Coolant supply unit
- 4 Chip conveyor
- 5 Spindle cooling unit & Hyd. tank unit
- 6 Transformer
- 7 Chip bucket (Opt.)
- 8 Oil-mist collector (Opt.)
- 9 Filtration unit (Opt.)



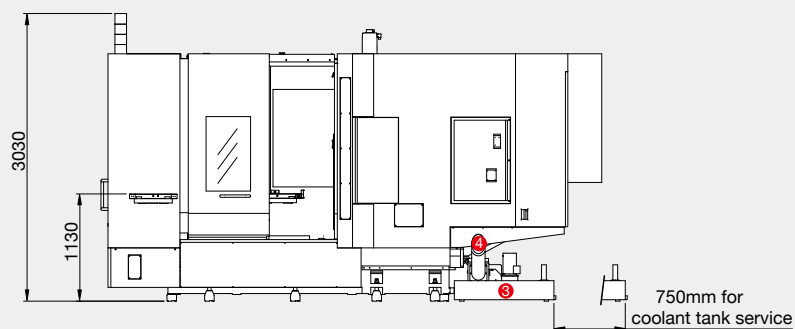
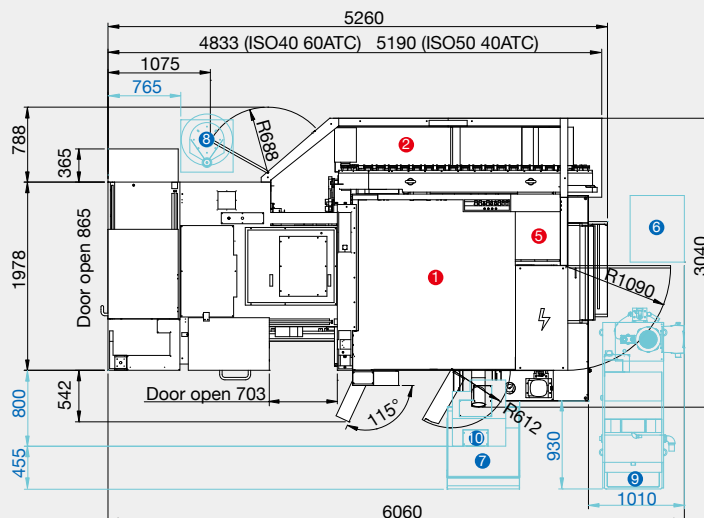




## Installation dimension

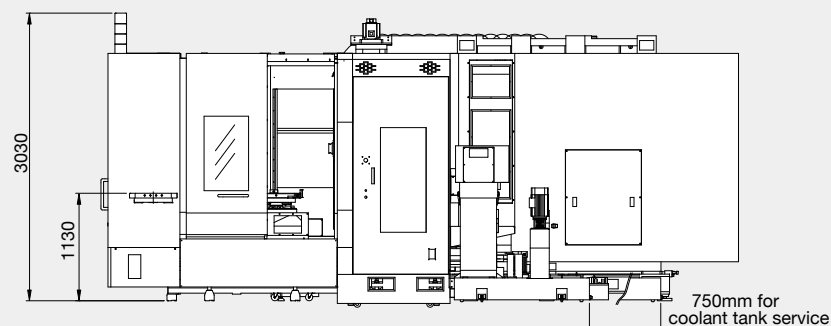
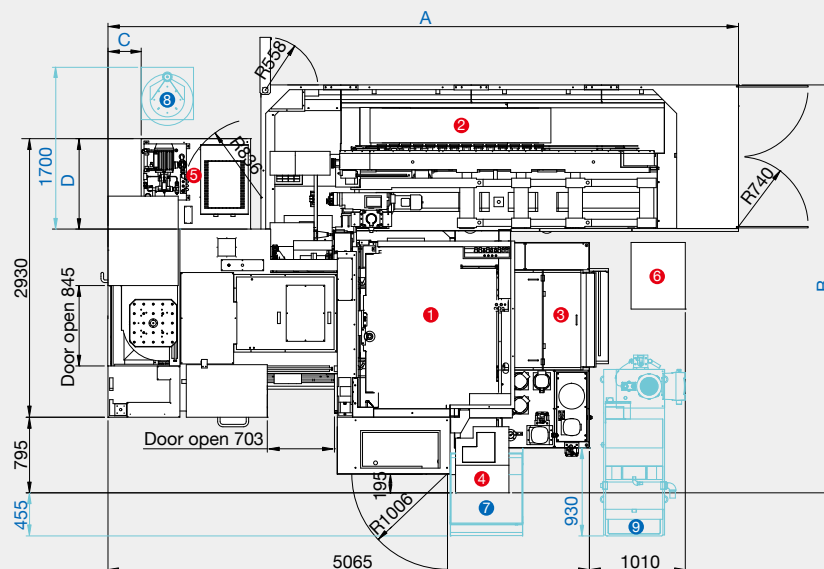
### HX504C/HX505C

- 1 Standard Machine
- 2 Magazine unit
- 3 Coolant supply unit
- 4 Spiral type chip auger
- 5 Spindle cooling unit & Hyd. tank unit
- 6 Transformer (Opt.)
- 7 Chip bucket (Opt.)
- 8 Oil-mist collector (Opt.)
- 9 Filtration unit (Opt.)
- 10 Chip conveyor (Opt.)



### HX504/HX505

- 1 Standard Machine
- 2 Magazine unit
- 3 Coolant supply unit
- 4 Chip conveyor
- 5 Spindle cooling unit & Hyd. tank unit
- 6 Transformer
- 7 Chip bucket (Opt.)
- 8 Oil-mist collector (Opt.)
- 9 Filtration unit (Opt.)



	HX504			
	A	B	C	D
60ATC	4,280	3,450	350	950
120ATC	4,800	3,620	350	950
240ATC	5,400	3,930	-	950

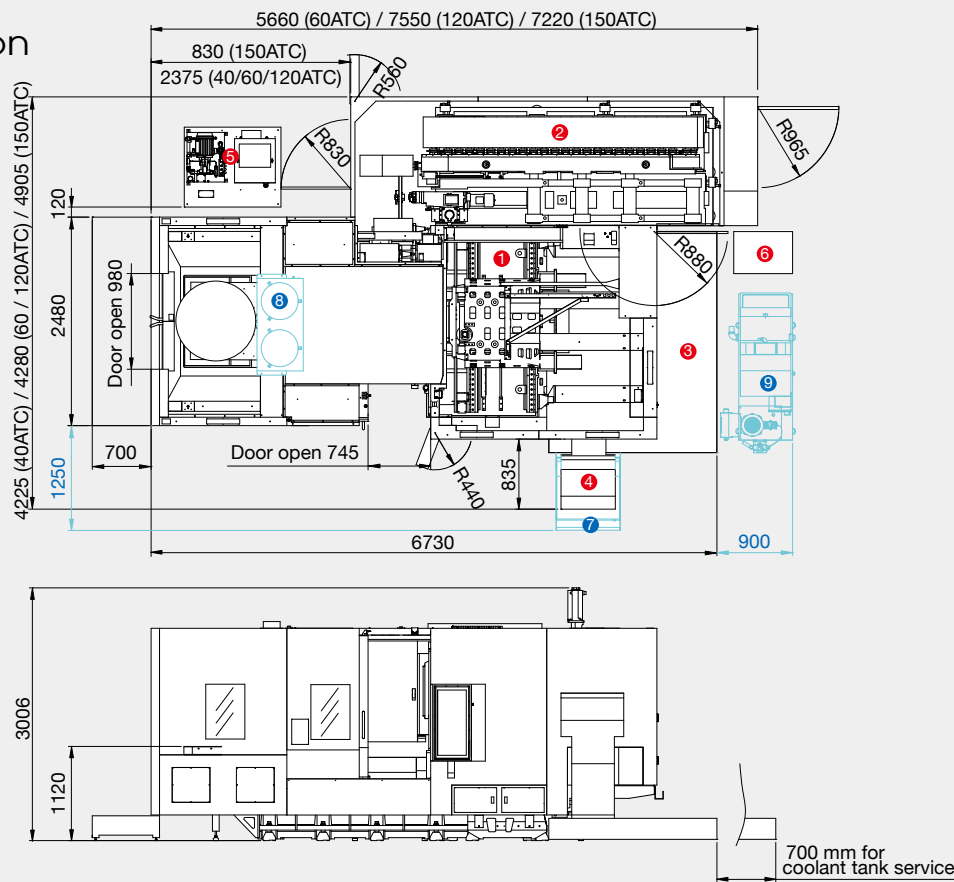
	HX505			
	A	B	C	D
40ATC	4,280	3,450	350	950
60ATC	4,800	3,620	350	950
120ATC	6,750	3,620	350	950
150ATC	6,630	4,300	-	950

# Machine Dimensions

## Installation dimension

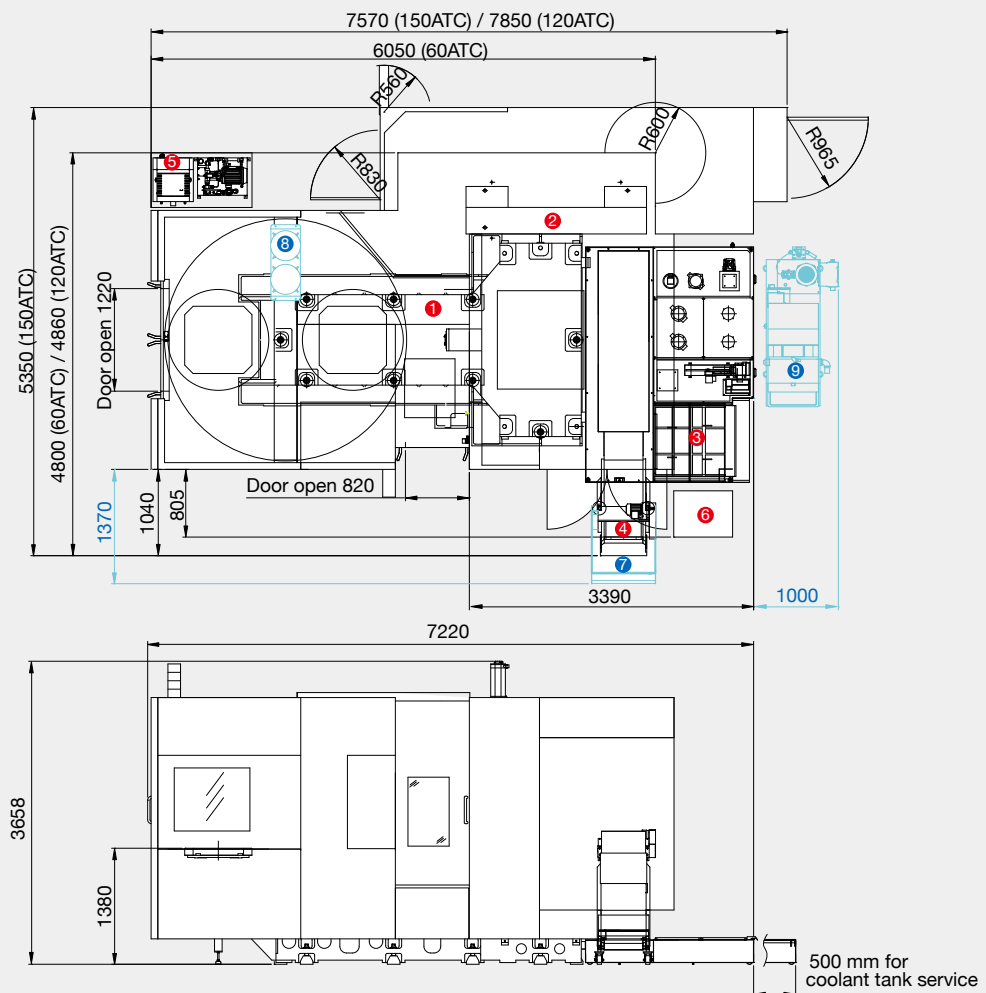
### HX635

- ❶ Standard Machine
- ❷ Magazine unit
- ❸ Coolant supply unit
- ❹ Chip conveyor
- ❺ Spindle cooling unit & Hyd. tank unit
- ❻ Transformer
- ❻ Chip bucket (Opt.)
- ❽ Oil-mist collector (Opt.)
- ❾ Filtration unit (Opt.)



### HX805

- ❶ Standard Machine
- ❷ Magazine unit
- ❸ Coolant supply unit
- ❹ Chip conveyor
- ❺ Spindle cooling unit & Hyd. tank unit
- ❻ Transformer
- ❼ Chip bucket (Opt.)
- ❽ Oil-mist collector (Opt.)
- ❾ Filtration unit (Opt.)



# We build machines in a hybrid way

- Very classic craftsmanship combined with most advanced modern equipments in a clean environment...

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