

HX504 SERIES

**HX500 series is the fourth generation of our
time proven
MK60H series (more than 500 units 1996-2007)**

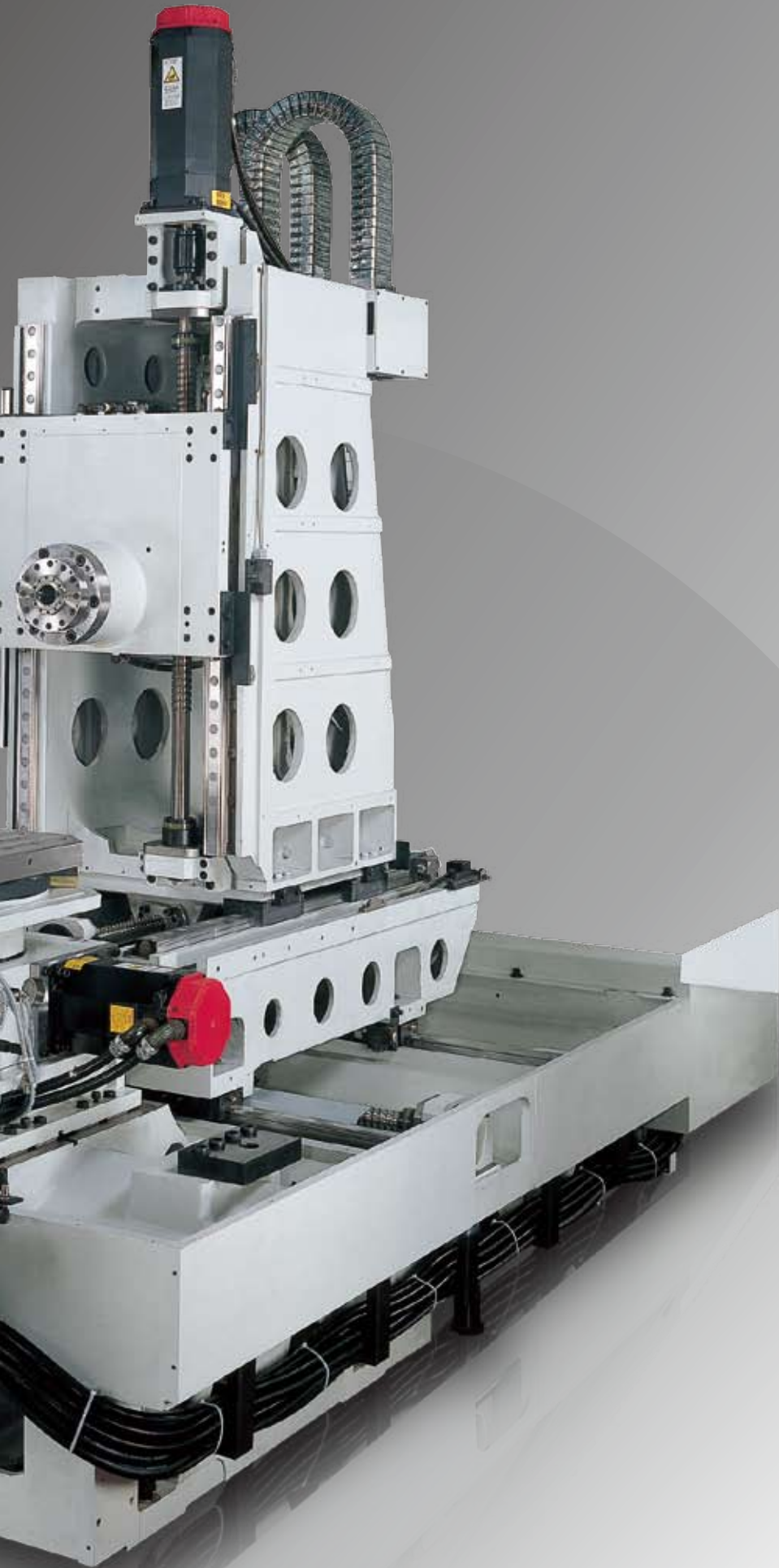




HX504A: NO.40 spindle, 1° table

HX504B : NO.40 spindle, 0.001° full B table





Thermal management

To meet more and more severe “WORKING ACCURACY” requirements, the “THERMAL MANAGEMENT” as standard on HX500 SERIES

Coupling spindle

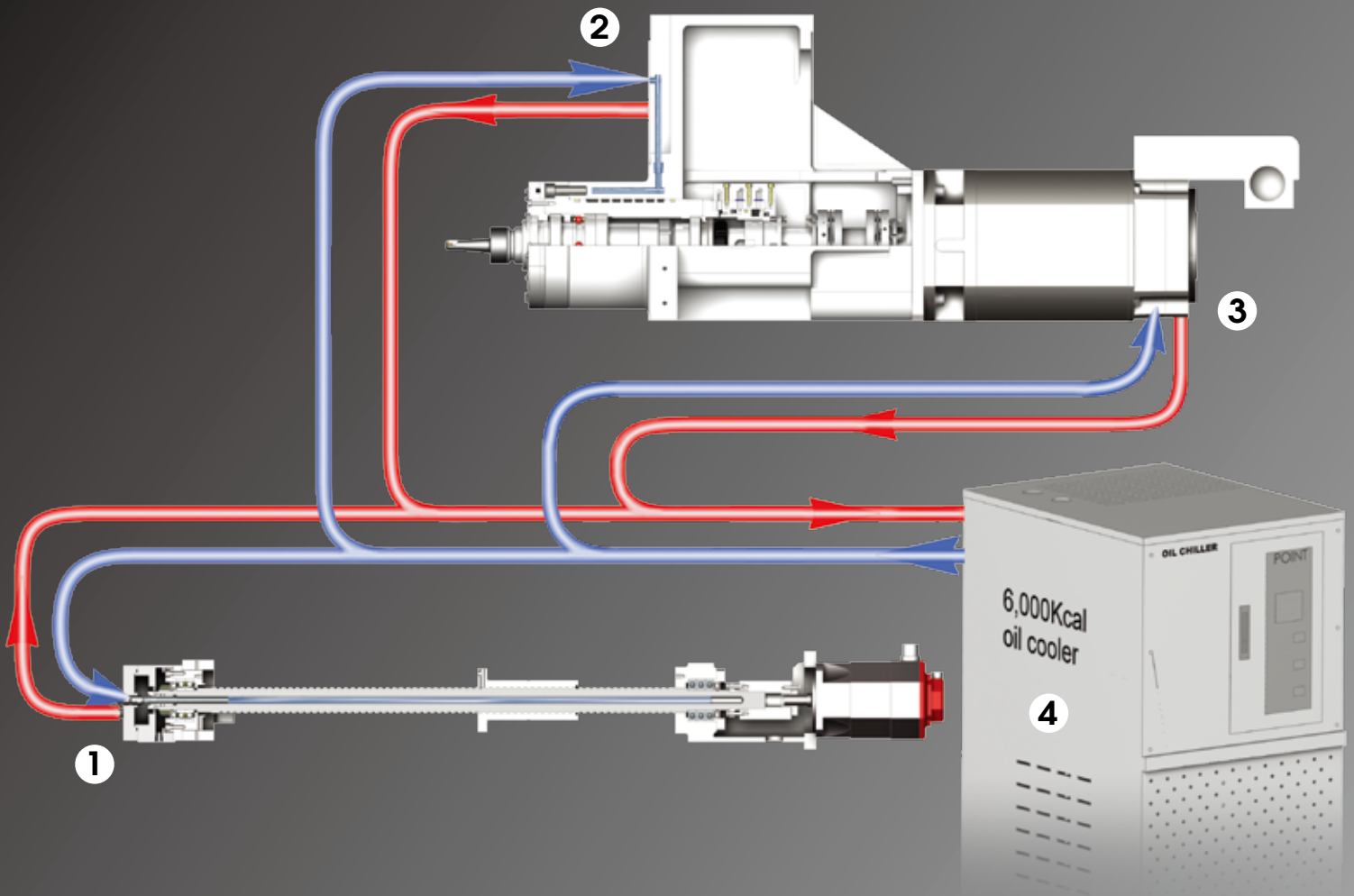
① Coolant through ball screw (CTB)

- To keep a). Under $\pm 10 \mu\text{m}$ repeatability on X, Y & Z
- b). Stable rigidity on ball screw system.

② Spindle cooling circuit

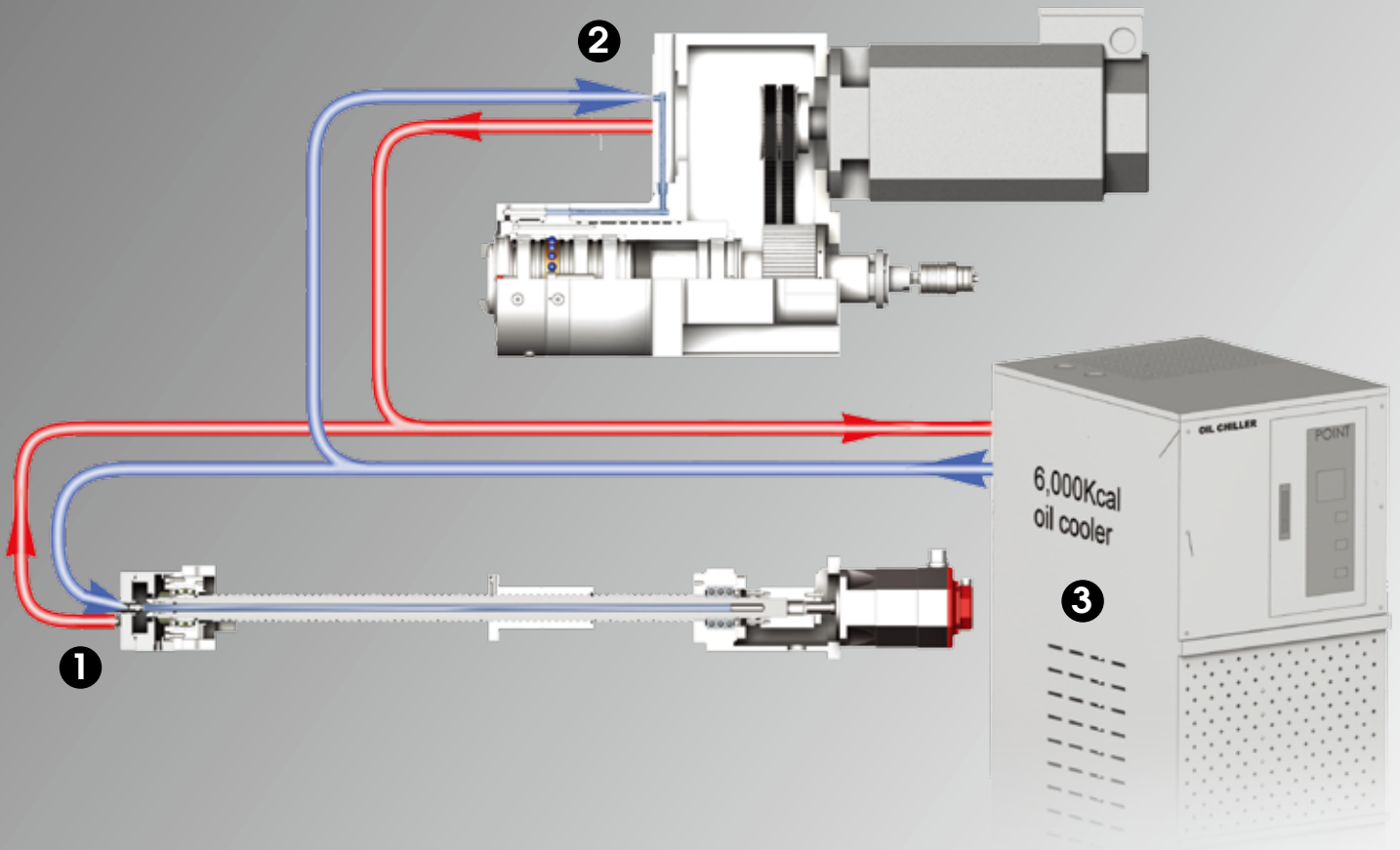
③ Spindle motor cooling circuit

④ 6,000 kcal large capacity oil cooler



Belt spindle

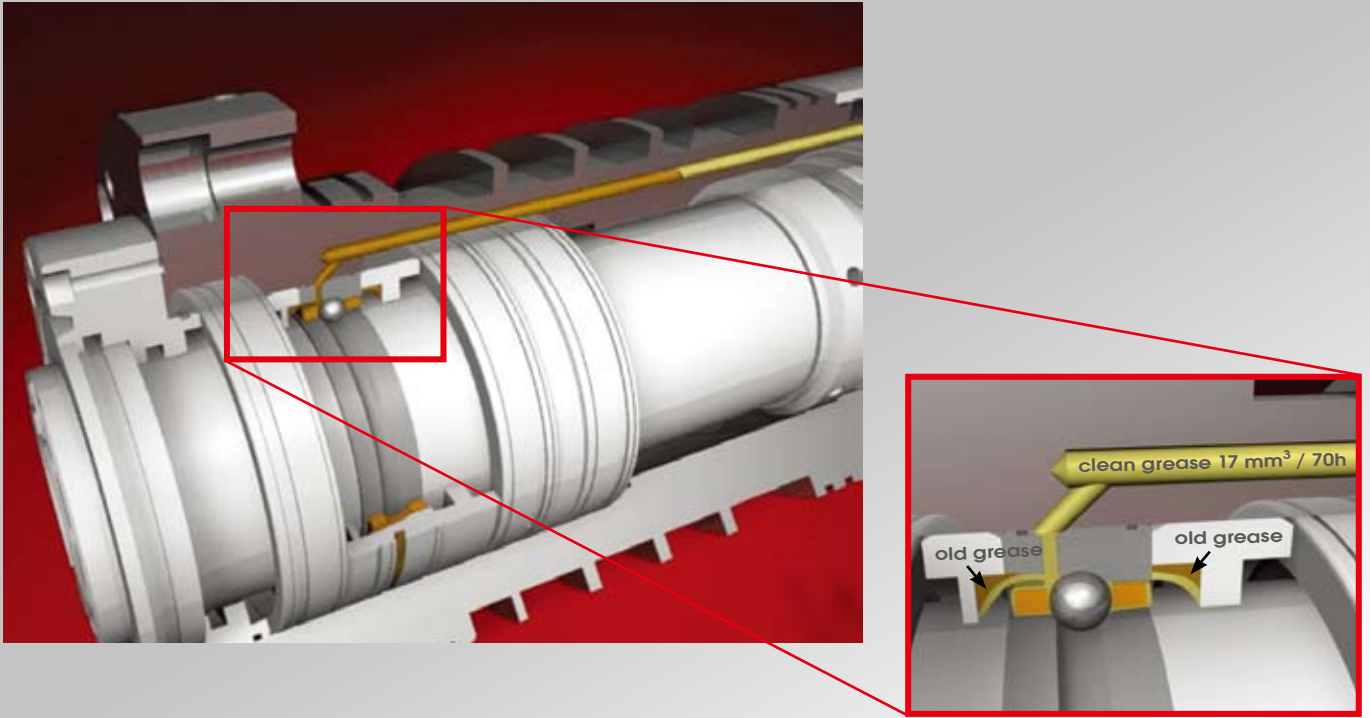
- ❶ Coolant through ball screw (CTB)
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- ❷ Spindle cooling circuit
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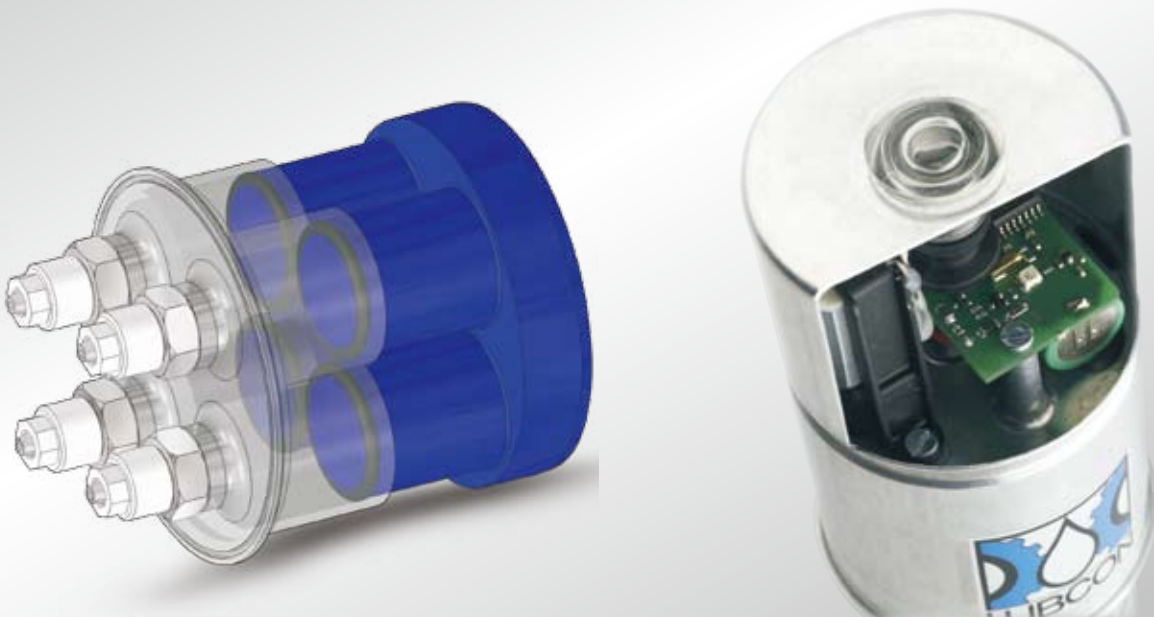
Unique spindle technology

Key principle

Use car industry re-greasing principle (by “LUBCON” GERMANY) to supply “clean grease” at 70 hr interval by 17mm^3 / shoot.



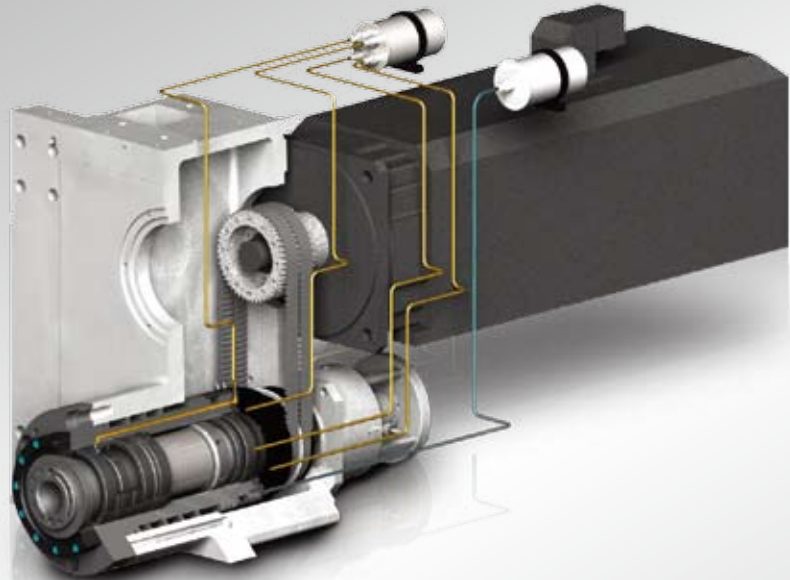
The grease chamber volume at 7.5cm^3 can support 28,840 hr.
This LUBCON unit service life at 3 years as minimum is guaranteed.



40 Taper

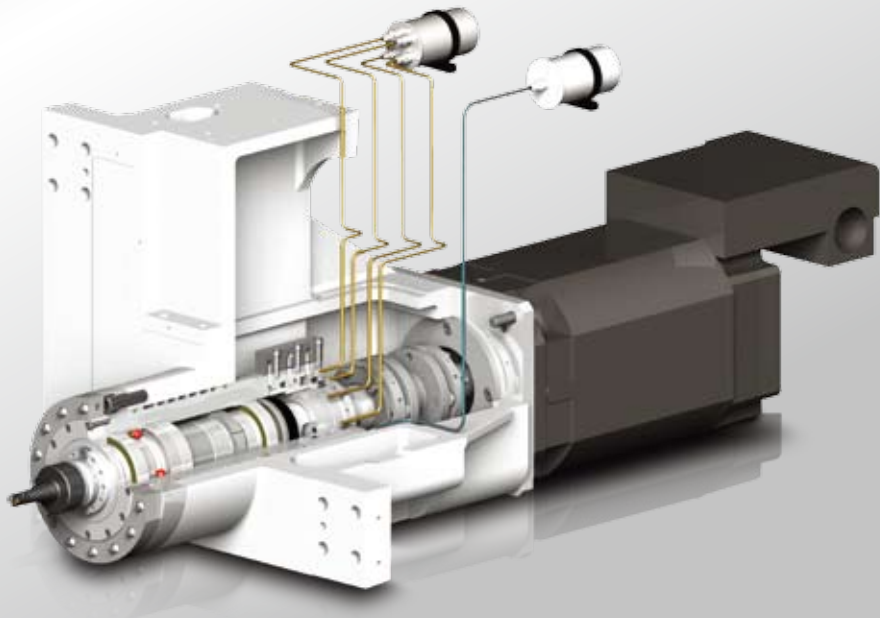
Belt spindle

- 9,000 min⁻¹
- 12,000 min⁻¹
- 15,000 min⁻¹



Coupling spindle

- 15,000 min⁻¹



BIG-PLUS double contact spindle as standard

Patented Worldwide
BIG-PLUS
SPINDLE SYSTEM PAT.
SIMULTANEOUS CONTACT

Simultaneous Taper & Flange Contact

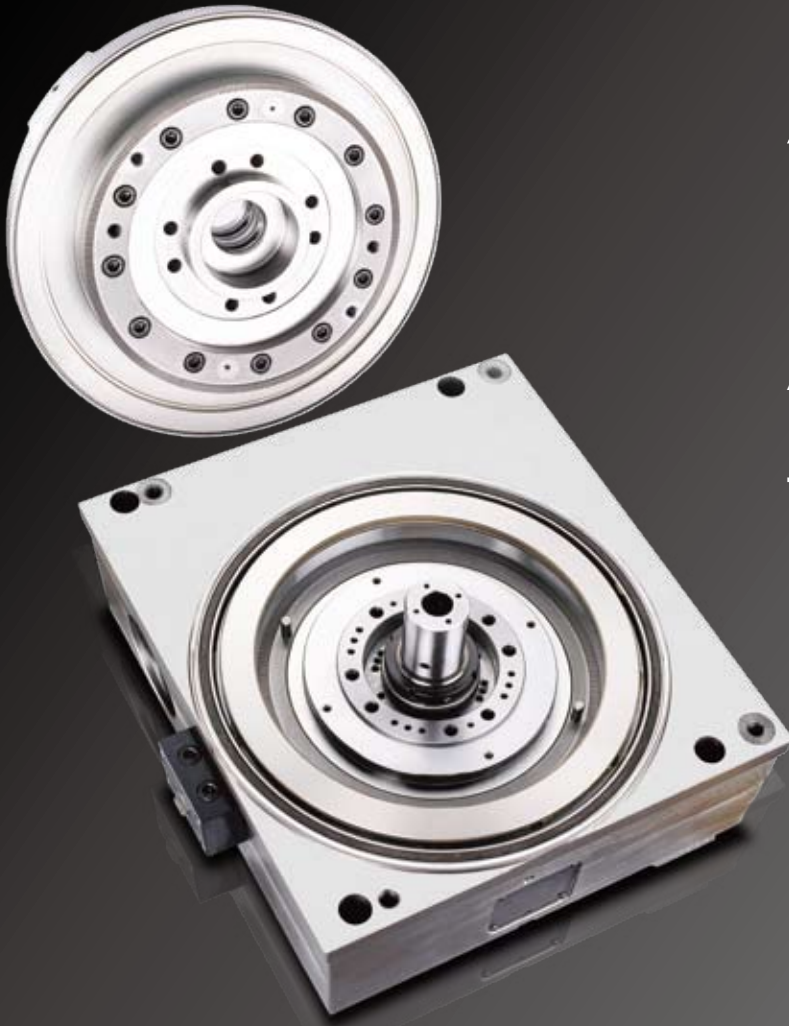
Maximum Contact

- Greater machining rigidity
- Higher cutting accuracy
- Extended cutting tool life
- Improved ATC repeatability

WISNER & MICHAEL (2008) LTD.

The advertisement features a close-up of a spindle with a double contact design, highlighted by a yellow circle and red arrows. The text is in a mix of bold black and red fonts.

4th axis table



A type :

Indexing table

Hirth coupling (1°) table

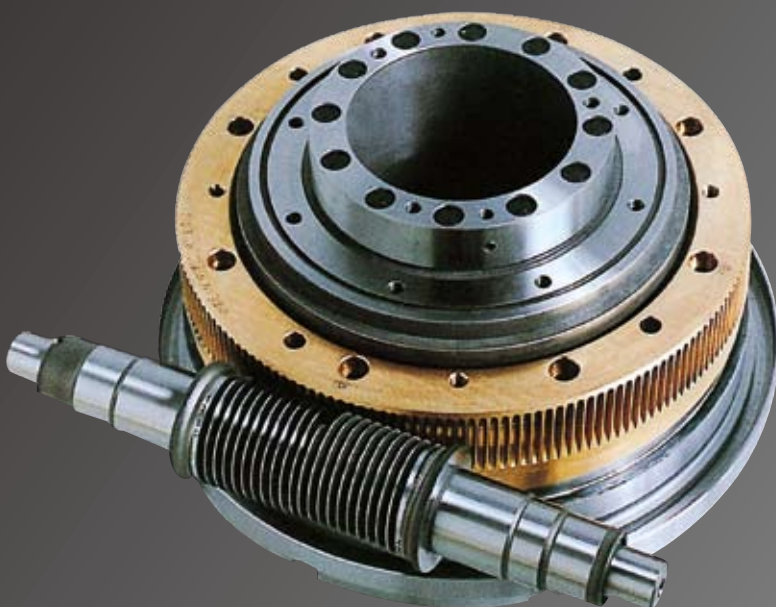
Pallet size: 500 x 500 mm

Accuracy: ± 3 sec

Large tooth coupling: $\varnothing 360$

Tilting moment: 7,500 Nm

High clamping force: 50,000 N



B type :

NC rotary table

unique OTT worm gear
system (0.001°) table

Pallet size: 500 x 500 mm

Tilting moment: 4,000 Nm

Clamping torque: 3,700 Nm

Drive torque: 1,500 Nm

A type:

Speed : 22.2 min⁻¹

0 ~ 90° : 0.9 second (w/o clamping)
2.2 second (w clamping)

B type:

Speed : 33.3 min⁻¹

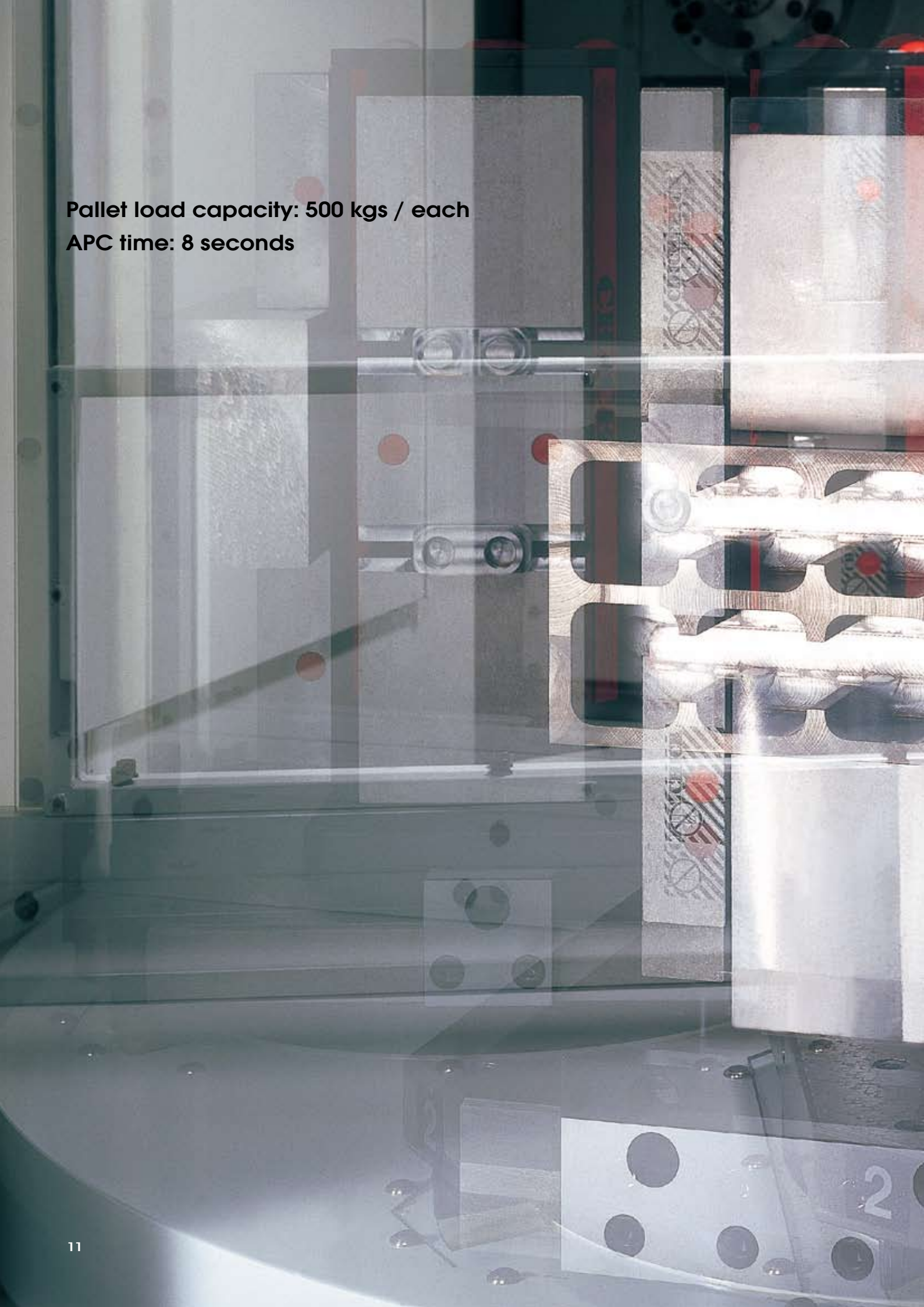
0 ~ 90° : 0.6 second (w/o clamping)
1.2 second (w clamping)

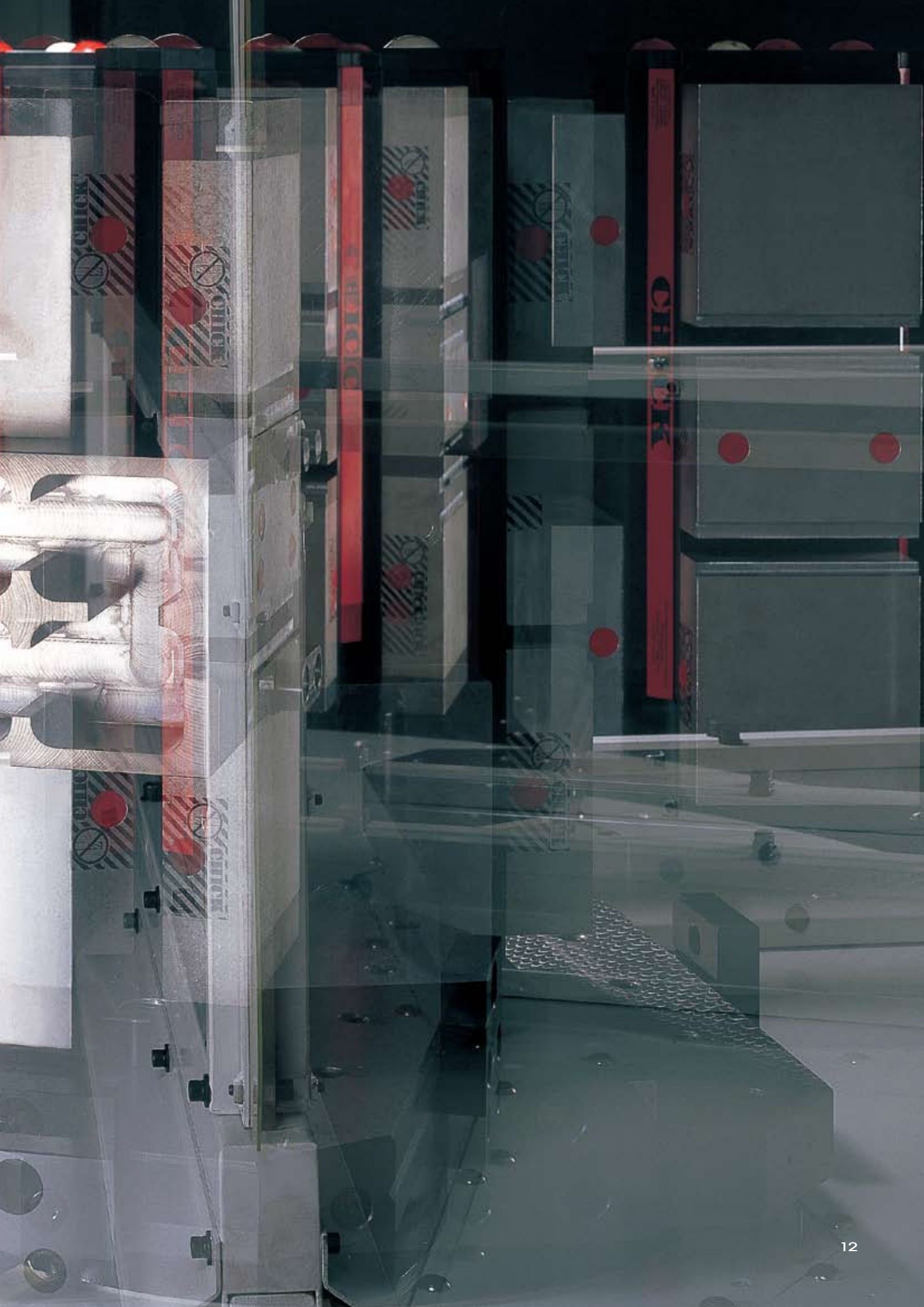


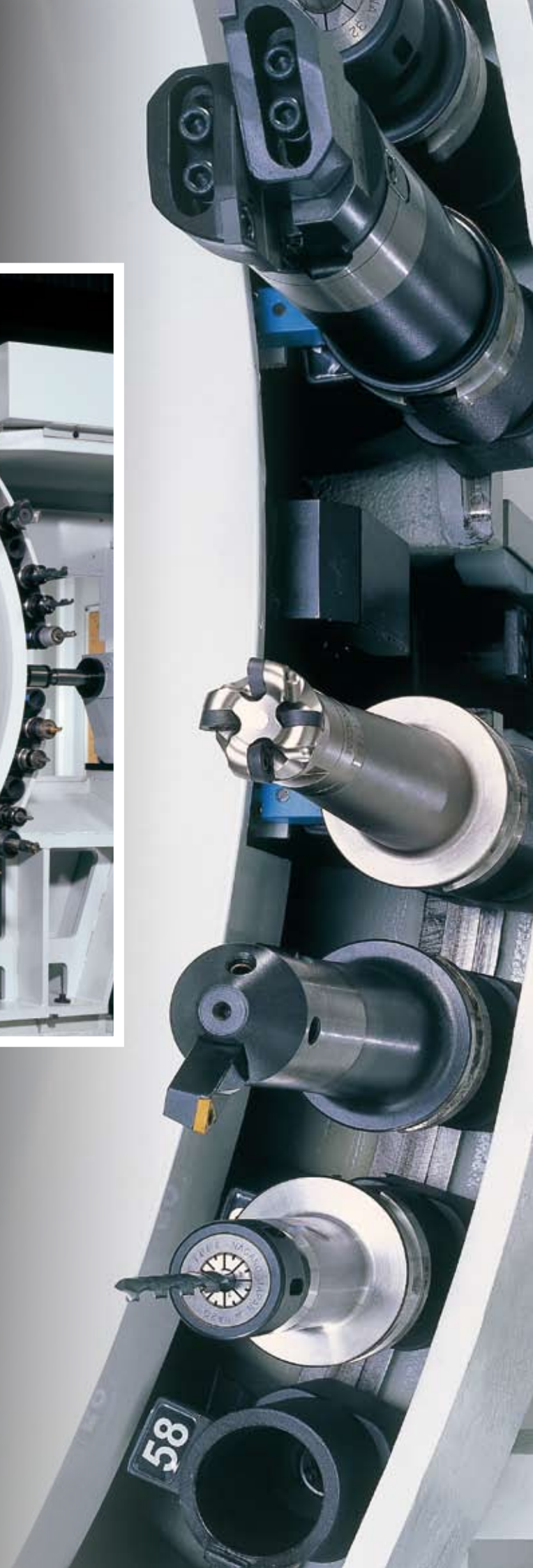
Four cones clamping system,
clamping force at 45,000 N



Pallet load capacity: 500 kgs / each
APC time: 8 seconds









Minimum moving parts & highest reliability

40 Taper:

Tool to tool: 2 seconds*

Chip to chip: 4.9 seconds

*** Tool weight under 6 kgs, 60Hz**

(some covers removed for explanation)

- a** Documentation & hand tool shelf
- b** Manual pallet rotation
- c** Powerful wash gun, 2.5 bar
- d** Ceiling wash down 3 bar at 60 L / min
- e** Better chip flow by augers direct to the rear
- f** Both scrapper or hinge type chip conveyor available
- g** Chip cleaning during machine running





b



c



d



e



f



g

Cutting performance

ST 60 ALMGS1 1

Tool: Ø80 x 6 Blades

S=1,000 min⁻¹ S=7,000 min⁻¹

F=1,800 mm/min F=10,000 mm/min

Q= 320 c.c/min Q=3,000 c.c/min

FACE MILLING

Tool: Ø40 x 5 Flutes

Ø40 W:25 D:50

S=240 min⁻¹ S=640 min⁻¹

F=101 mm/min F=500 mm/min

Q=126 c.c/min Q=625 c.c/min

END MILLING

Tool: Ø54

Ø40 W:25 D:50

S=880 min⁻¹ S=2,000 min⁻¹

F=180 mm/min F=380 mm/min

Q=412 c.c/min Q=870 c.c/min

DRILLING (W/T.S.C)

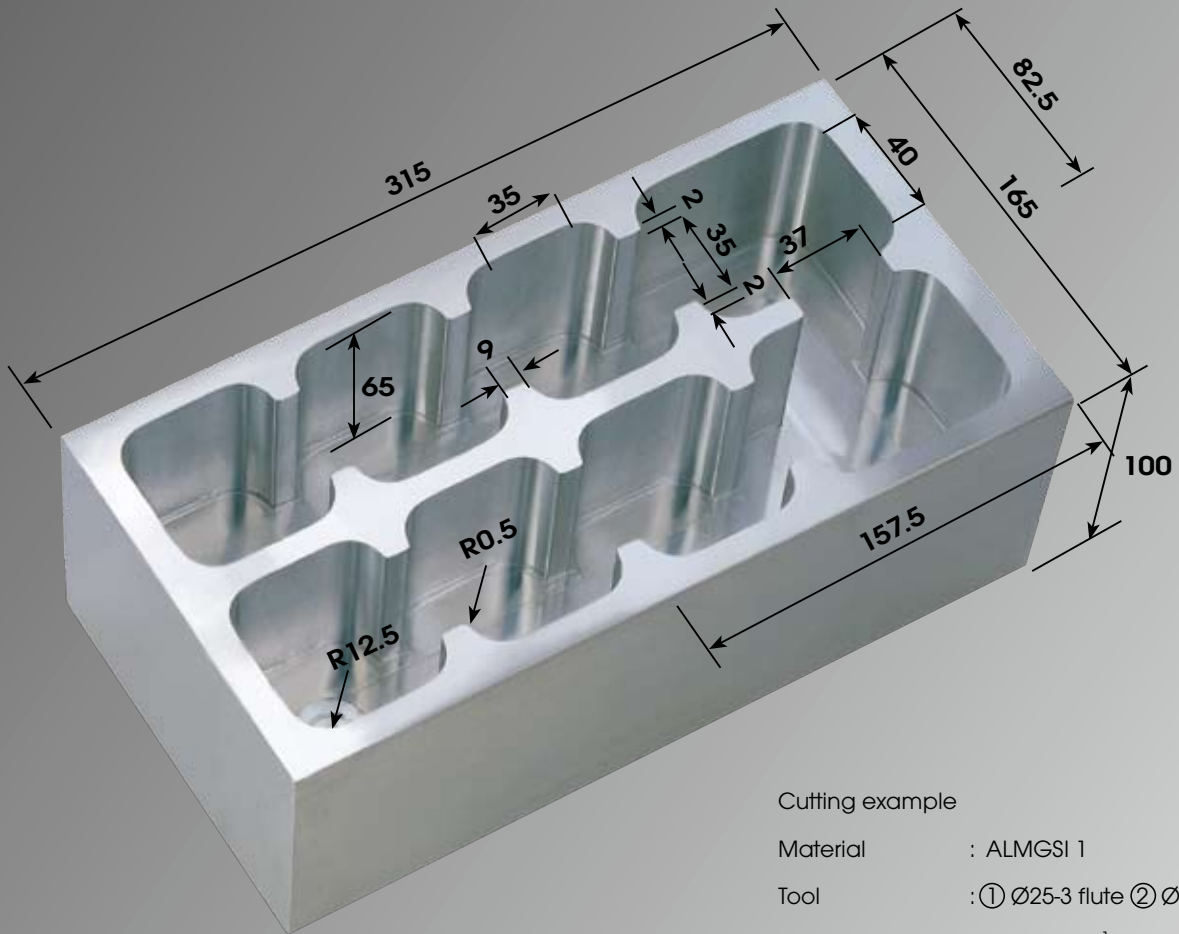
Tool: M36 x P4.0

S=177 min⁻¹ S=186 min⁻¹

F=708 mm/min F=744 mm/min

TAPPING

Heavy duty & high Speed

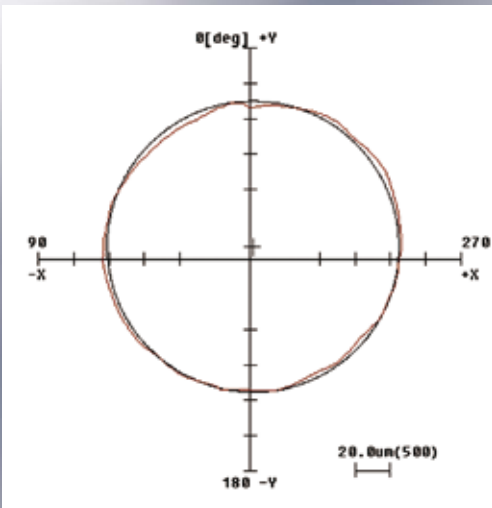


Cutting example

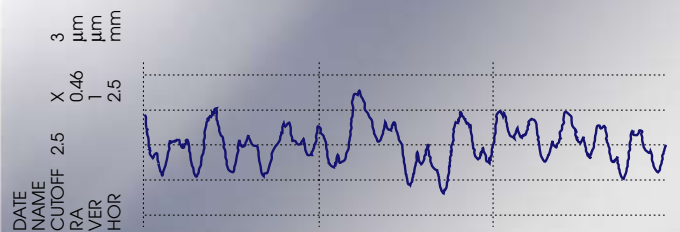
Material : ALMGSI 1
 Tool : ① Ø25-3 flute ② Ø16-3 flute
 Spindle speed : 15,000 min⁻¹
 Cutting speed : 1,178 m/min
 Feed : 6,500 mm/min
 Time : 7.5 min

High Accuracy

Roundness : 4 μm (with standard scales)



Surface roughness : 2.2 μm (Rmax.)



MITUTOYO SURFTTEST 201

Material : ALMGSI 1
 Tool : Face cutter Ø80 x 3 blades
 Spindle speed : 10,000 rpm
 Cutting speed : 2,513 m/min
 Feed : 4,000 mm/min

HX504 series

Technical data	HX504									
	A / B									
	E			P						
	/9B	/12B	/15B	/9B	/12B	/15B	/15C	/15D		
Work range										
Pallet size (mm)		500 X 500								
Max. work swing diameter (mm)		Ø680 / Ø760								
Max. work piece height (mm)		710								
Pallet load capacity (kg)		500								
Travel X / Y / Z (mm)		710 / 610 / 650								
Min. incremental on table (degree)		1° / 0.001°								
Pallet surface to spindle center (mm)		85 ~ 695						105 ~ 715		
Spindle nose to pallet center (mm)		150 ~ 800								
Pallet surface configuration		24 - M16@ Pitch 100 mm grid								
Feed drive										
Feed force		X (N)			6,283		8,639 (F) 10,249 (T)			
		Y (N)			11,519		8,639 (F) 10,249 (T)			
		Z (N)			6,283		8,639 (F) 10,249 (T)			
Rapid movement		X / Y / Z (m/min.)			32		48			
		B (sce. / 90°)			2.5 / 1.2					
Acceleration		X / Y / Z (m/s ²)			3 / 4 / 4		4 / 5 / 6			
Dia. / Pitch of ball screw (mm)		Ø45 / 12			Ø45 / 16					
Main spindle										
Spindle taper ISO		40 Taper								
Max. spindle speed		9,000	12,000	15,000	9,000	12,000	15,000	15,000	15,000	
Spindle base speed		F	1,125	1,500	1,875	1,125	1,500	1,875	-	600(460*)
		T	-	-	-				1,500	-
Spindle output kW (S6-40%)		F	22*			30			-	30(37*)
		T	-			30			25	-
Spindle output torque Nm (S6-40%)		F	187*	140*	112*	255	191	153	-	350(456*)
		T	-	-	-	255	191	153	159	-
Spindle transmission		Belt			Belt			Couping		
Spindle diameter (mm)		Ø70								
Position accuracy										
ISO230-3 / JIS (mm)		w/o linear encoder			0.015 / 0.008					
		W linear encoder			0.008 / 0.004					
Tool changer										
Tool selection		Random								
Magazine position		60								
Max. tool dia. / without adjacent (mm)		Ø80 / Ø150								
Max. tool length (mm)		350								
Max. tool weight (kg)		10								
Max. tool moment from gauge line (Nm)		18								
Tool to tool time (sec.)		2								
Chip to chip time (sec.)		5.8			4.9					
Pallet changer										
Number of pallet		2								
Method of pallet change		Swing arm								
Pallet change time (sec.)		8								
Repeatability of pallet changing (mm)		0.02								

Note: 1) All the specification is based on power at 60 Hz

2) * At S3-25%

3) ** Available from 2008

Main spindle

40 Taper Belt spindle - 9,000 min⁻¹ & 12,000 min⁻¹ & 15,000 min⁻¹
 Coupling spindle - 15,000 min⁻¹

Control

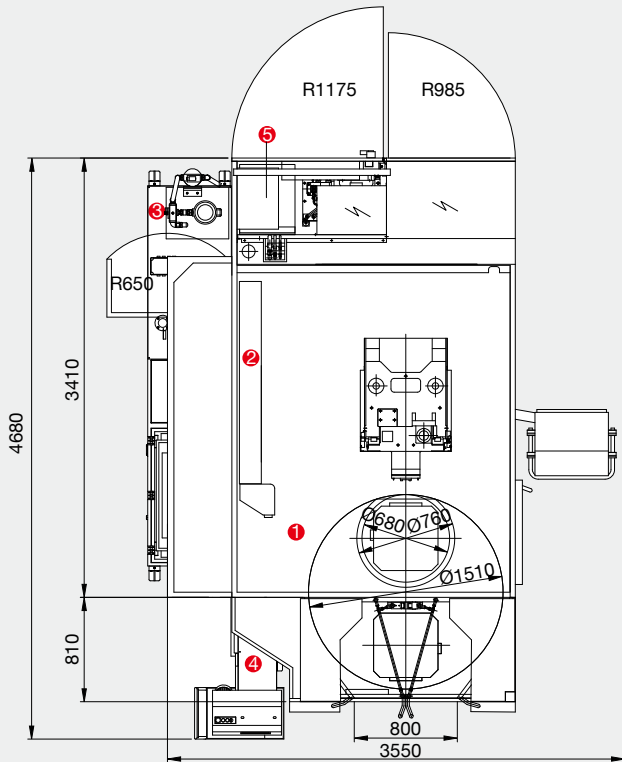
(F): QUASER mill i (For E type)
 FANUC 18iMB (For P type)
 (T): HEIDENHAIN iTNC530 (For P type)**

Technical data	HX504								
	A / B								
	E			P					
	/9B	/12B	/15B	/9B	/12B	/15B	/15C	/15D	
Coolant system									
Coolant tank capacity (liter)	685 (650 + 35)								
Pump capacity	3 bar @ 60 L / min.								
- Nozzle coolant	20 bar @ 25 L / min.								
- Through spindle coolant	3 bar @ 60 L / min.								
- Wash down coolant	3bar @ 60 L / min.								
- Ceiling coolant									
Machine size									
Floor space W x D (mm)	3,675 x 4,680								
Height (mm)	3,100								
Weight (kg)	13,000								
Connections									
Main power	220 V or 400 V								
Power consumption (KVA)	35			40			45		
Pneumatic air consumption	6 ± 1 bar, 550 NL / min.								

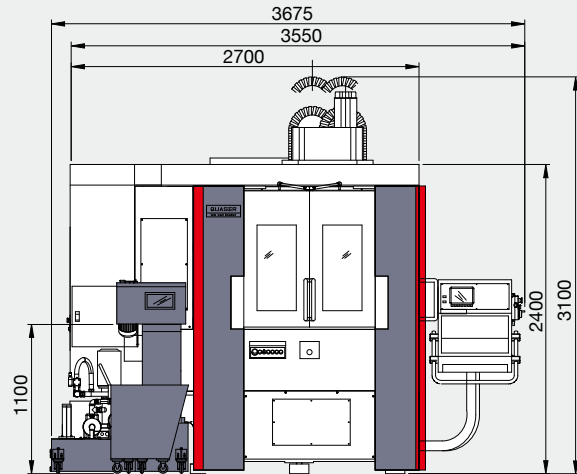
● = Standard ○ = Option ✕ = N / A

Standard / option accessories	HX504								
	A / B								
	E			P					
	9B	12B	15B	9B	12B	15B	15C	15D	
■ QUASER mill i	●	●	●	✕	✕	✕	✕	✕	
■ FANUC 18iM-B	✕	✕	✕	●	●	●	✕	●	
■ HEIDENHAIN iTNC530	✕	✕	✕	○	○	○	●	✕	
■ Spindle oil chiller	●	●	●	●	●	●	●	●	
■ Through ball screw cooling	●	●	●	●	●	●	●	●	
■ Linear scale on X / Y / Z (Absolute 0.05 μm)	○	○	○	○	○	○	○	○	
■ 1° index table	●	●	●	●	●	●	●	●	
■ 0.001° rotary table	●	●	●	●	●	●	●	●	
■ 40 taper / 60 position tool magazine	●	●	●	●	●	●	●	●	
■ 40 taper tooling system ~ Shank / Pull stud	MAS-403 BT40 / PS-G51	○	○	○	○	○	○	○	
	ISO-7388/1 / ISO-7388/2	●	●	●	●	●	●	●	
	DIN-69871 / DIN-69872-A	○	○	○	○	○	○	○	
■ 2 Pallets station	●	●	●	●	●	●	●	●	
■ Extra pallet	○	○	○	○	○	○	○	○	
■ Tool length measurement	BLUM	○	○	○	○	○	○	○	
	RENISHAW NC-4	○	○	○	○	○	○	○	
	RENISHAW TS-27R	○	○	○	○	○	○	○	
■ Work probe	RENISHAW OMP-40	○	○	○	○	○	○	○	
■ Coolant system	Nozzle coolant	●	●	●	●	●	●	●	
	Base wash down	●	●	●	●	●	●	●	
	Ceiling wash down	●	●	●	●	●	●	●	
	Coolant wash gun (2 sets)	●	●	●	●	●	●	●	
■ Coolant through spindle	20 bar	●	●	●	●	●	●	●	
	50 bar	○	○	○	○	○	○	○	
■ Dual chip augers	●	●	●	●	●	●	●	●	
■ Chip conveyor	Scrape type	●	●	●	●	●	●	●	
	Hinge type	○	○	○	○	○	○	○	
■ Work light	●	●	●	●	●	●	●	●	
■ Machine status light	●	●	●	●	●	●	●	●	
■ CE & EMC	●	●	●	●	●	●	●	●	

Installation dimension

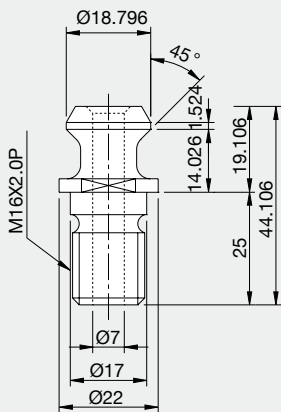


- 1** Standard machine
- 2** Magazine unit
- 3** Coolant supply unit
- 4** Chip conveyor
- 5** Spindle cooling unit & Hyd. tank unit

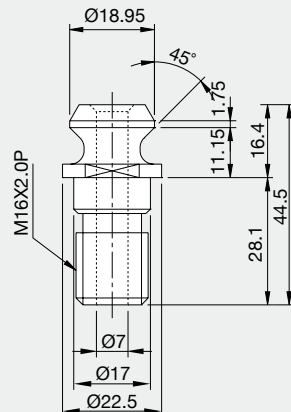


Pull stud and applicable tools

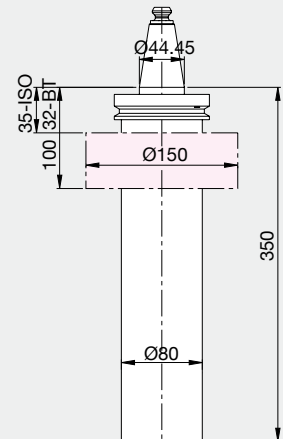
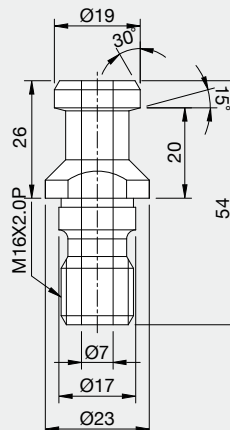
BT 40 (QUASER SUPPLY)



ISO (7388-B)



DIN (69872-A)





www.quaser.com

Fold here for filing!

07100903 **MaCHS** TEL. 04.2473326