

QUASER

we cut faster

MK603S SERIES

MK603S series is our third generation of MK60S vertical machining center.

The MK603S series achieves:

- Large work area configuration with compact foot print
- High efficiency
- High reliability



Economic Machine

MK 603SE

25 KW

Belt Spindle

- 9,000 min⁻¹, 212 N.m

- 12,000 min⁻¹, 159 N.m

- 32 m/min

QUASER mill i

Performance Machine

MK 603SP

35 KW

Belt Spindle

- 9,000 min⁻¹, 297 N.m

- 12,000 min⁻¹, 223 N.m

- 32 m/min (option 48m/min
with Linear scale)

FANUC 31i B

MK 603SP

26 KW

Coupling Spindle

- 15,000 min⁻¹, 177 N.m

- 20,000 min⁻¹, 125 N.m

- 32 m/min (option 48m/
min with Linear scale)

FANUC 31i B

All following items are standard::

- 20 bar coolant through spindle
- Swarf management system including: auto flush, chip augers, chip conveyor and full enclosures
- Dual-pallet swing type APC
- 48 position ATC



Note: The object might be different from the photos of catalogue if there is any specification update.

Column moving design on X/Y/Z axes, with high rigidity machine base, which provide less geometric error with different work-piece weight, and trouble free from chips and coolant.

- X axis span at 900 mm
- Y axis span at 500 mm
- Z axis span at 430 mm

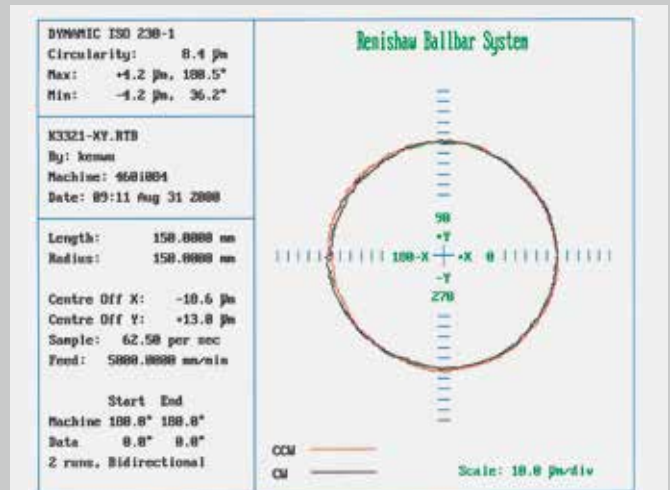
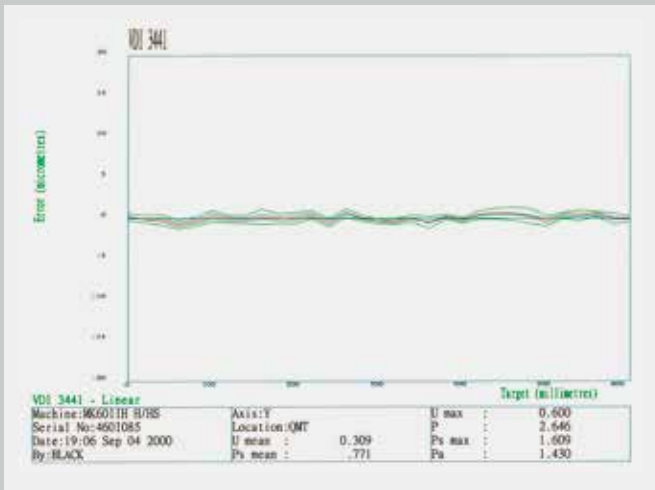




Heavy duty $\varnothing 45$ mm pretensioned ball screws, directly coupled with AC servo motors, achieve consistent high accuracy.

3 axes $0.05 \mu\text{m}$ absolute linear scales are option.

Motor	MK603SE	MK603SP
X / Y / Z (kW)	3 / 3 / 4	4 / 4 / 4



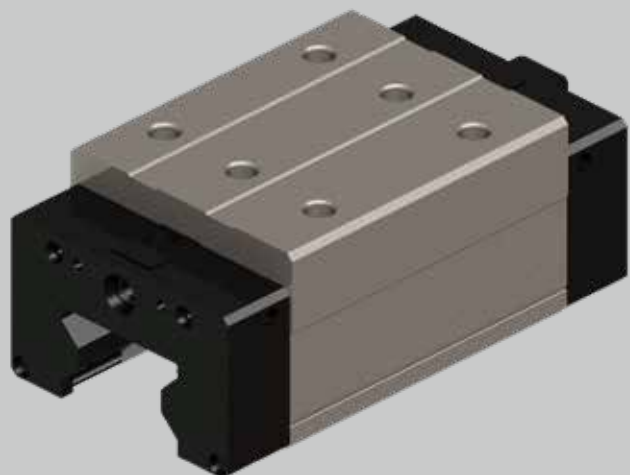
Note: The measuring results indicated in this catalog are provided as an example by random selection.

Super heavy-duty roller linear ways

X-axis linear ways size 55

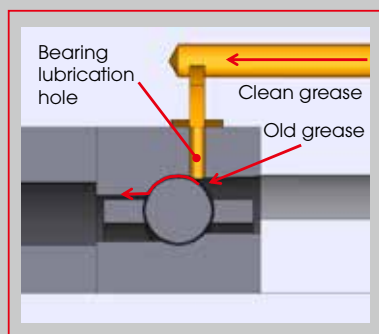
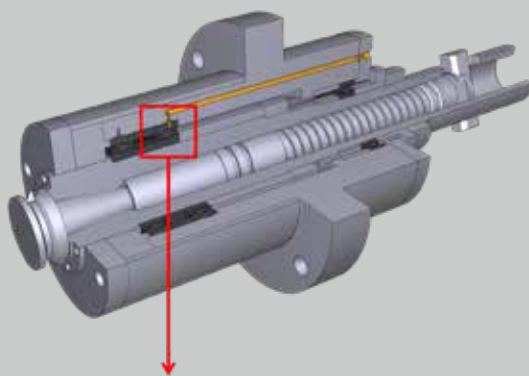
Y-axis linear ways size 55

Z-axis linear ways size 45



Spindle System

- Grease supply system is designed to be stable and eco-friendly by supplying new grease intermittently to the bearing during the high speed rotation.



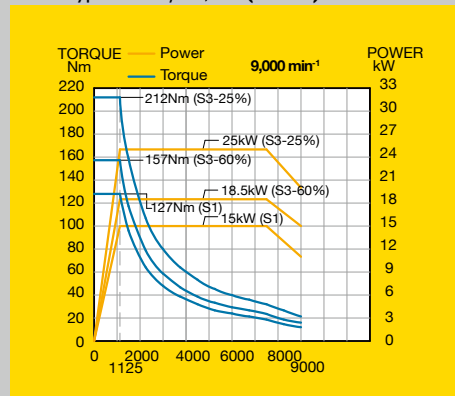
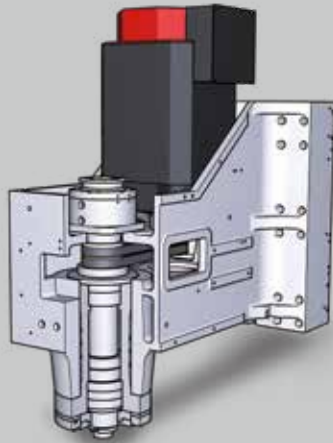
- Standard on all models



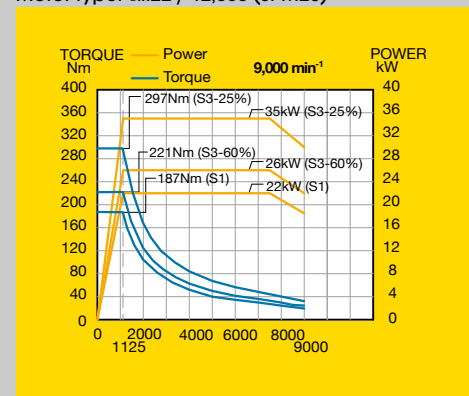
New spindle code	MB-4.0				MC-4.1R	MC-4.0R
Shaft diameter	Ø70 / Ø65				Ø80 / Ø65	Ø70 / Ø60
Spindle Taper	ISO-40				ISO-40 / HSK A63	
Bearing arrangement	< > =				< > =	< > =
Ball bearing type	Ceramic				Ceramic	Ceramic
Roller bearing type	Steel				Steel	Ceramic
Bearing lubrication	Grease packed				Re-Grease	Re-Grease
Transmission	Belt				Coupling	Coupling
Spindle motor	α il15/12,000 (SPM22)		α il22/12,000 (SPM26)		α ilT15/15,000 (SPM30)	α 8/20,000iL (SPM30i)
Spindle Speed	9,000	12,000	9,000	12,000	15,000	20,000
FANUC						
Spindle base speed	1,125	1,500	1,125	1,500	1,400	1,150
Spindle output power kW (S3-25%)	25	25	35	35	26	15
Spindle output torque Nm (S3-25%)	212	159	297	223	177	125
CTS Availability	●	●	●	●	●	●
Available NC	FANUC = ●					
MK603SE	●	●	-	-	-	-
MK603SP	-	-	●	●	●	●

MB-4.0

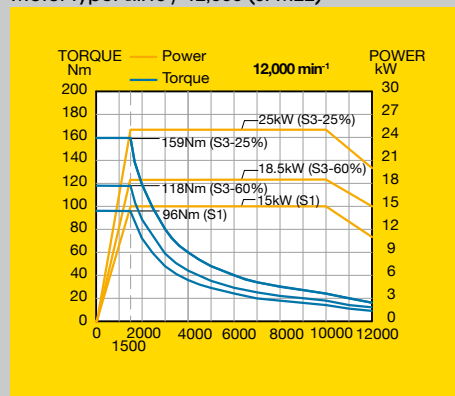
Belt
Motor type: α il15 / 12,000 (SPM22)



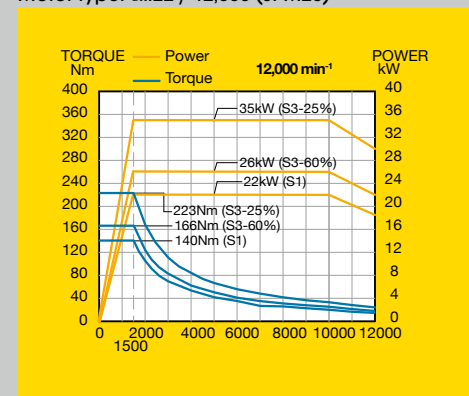
Belt
Motor type: α il22 / 12,000 (SPM26)



Belt
Motor type: α il15 / 12,000 (SPM22)

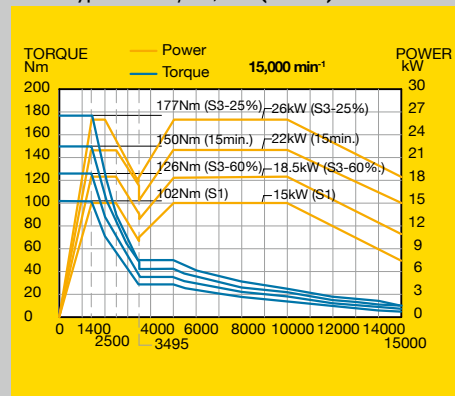


Belt
Motor type: α il22 / 12,000 (SPM26)



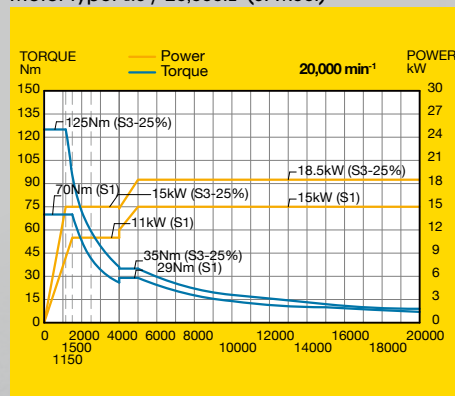
MC-4.1R

Coupling
Motor type: α ilT15 / 15,000 (SPM30)



MC-4.0R

Coupling
Motor type: α 8 / 20,000iL (SPM30)



Pallet system

Pallet load capacity: 300 kgs/each end

APC time: 8 seconds

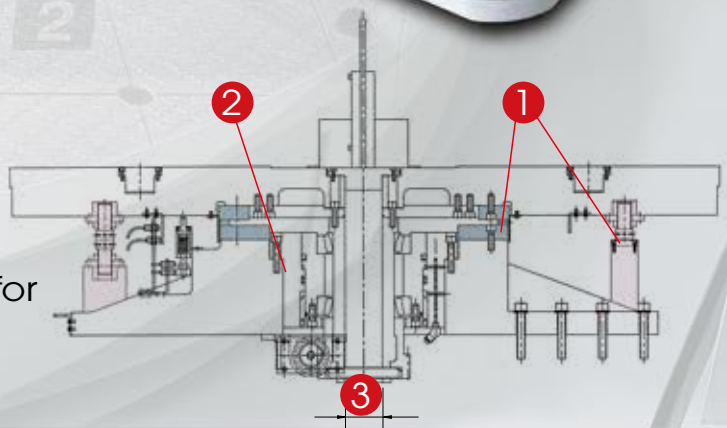


Two fourth axis tables (ø255) with tailstocks or fixtures with hydraulic end supports can boost maximum efficiency. (option)



Rigid & reliable system

- 1 $\varnothing 600$ mm curvic coupling plus two end supportors
- 2 50,000 N clamping force
- 3 Center through hole $\varnothing 80$ mm (for hydraulic or 4th axis table)



ATC system

Minimum moving parts to achieve highest reliability

Tool to tool : 2.5 seconds

Chip to chip : 5 seconds on MK603SP

: 6 seconds on MK603SE



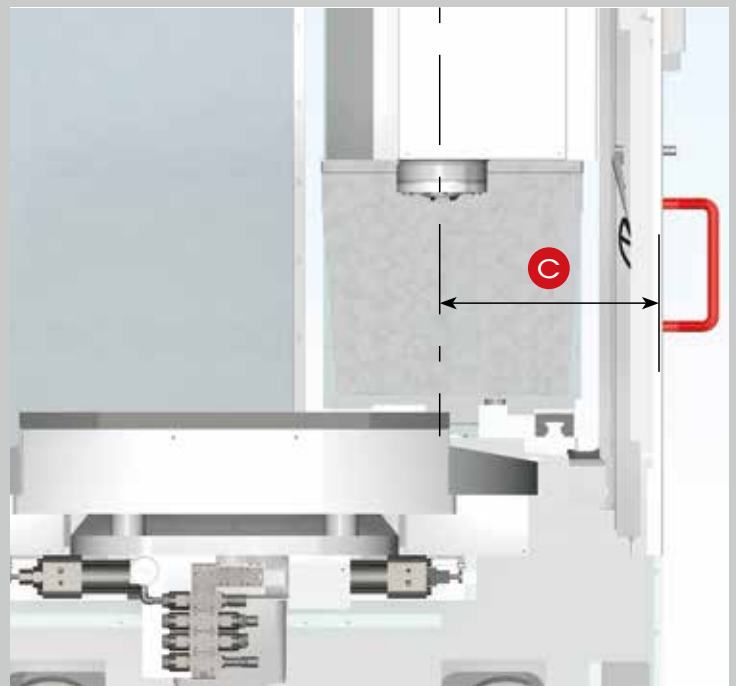
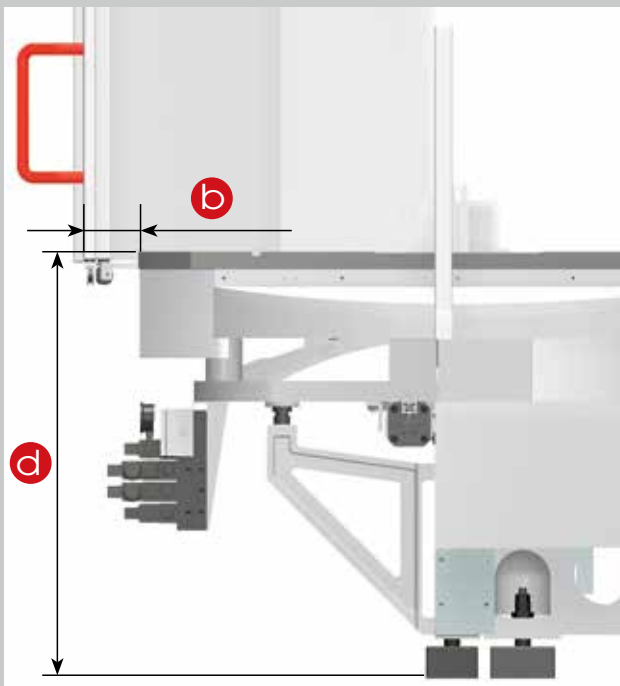
48 pos. magazine



Ergonomic and Space-saving design

Built from operator's view

- a** Ergonomic operator control panel
- b** Good accessibility from edge of table to operator- minimum distance 150 mm
- c** Side door to spindle is 535 mm
Allows convenient access for manual tool loading/unloading from spindle.
- d** Table surface to floor at 1000 mm
- Large door opening 1000 mm
- e** Documentation & hand tool shelf
- f** Tool shelf



Our attention to small details shows that we care

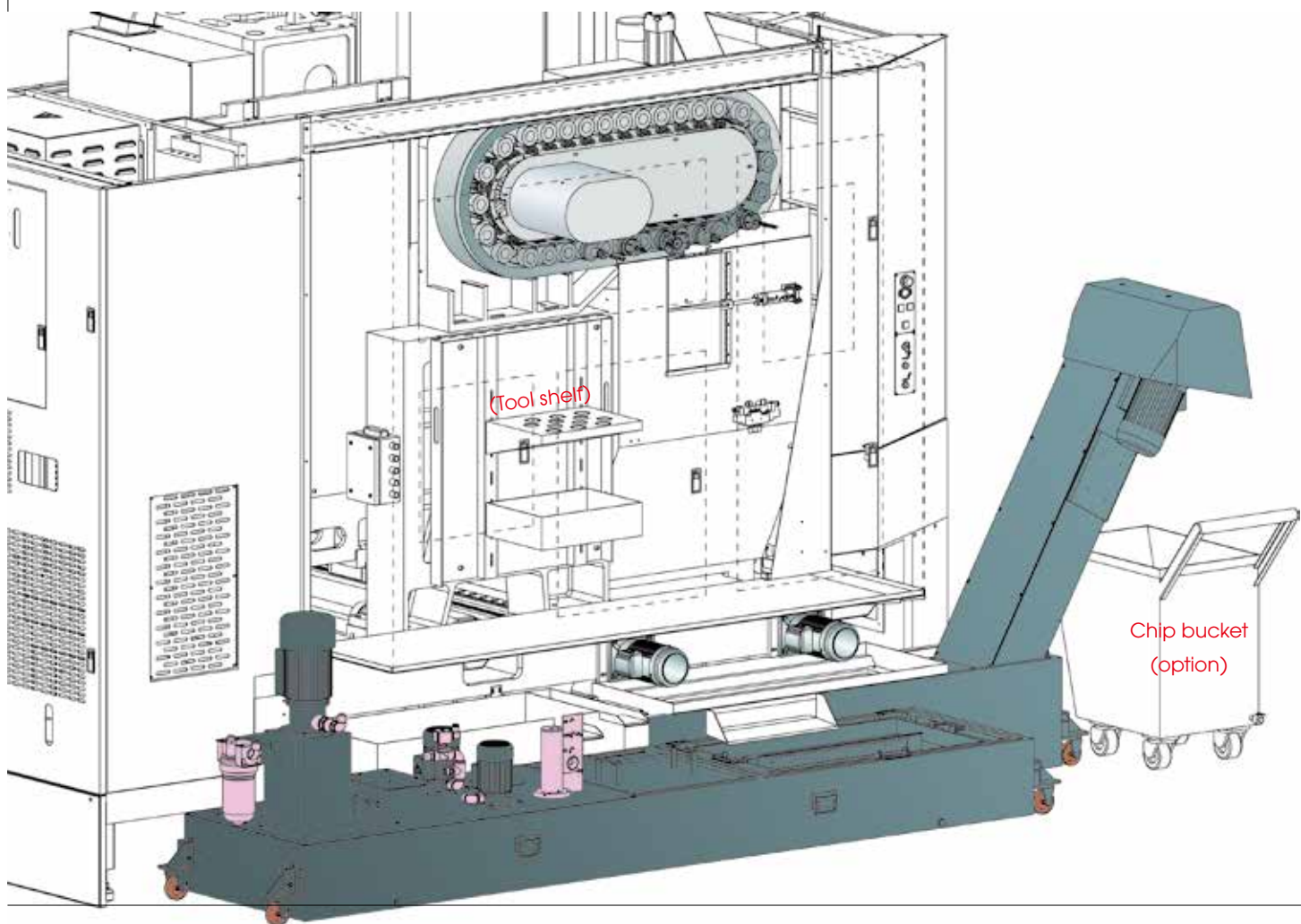


Coolant system & Chip management

The best swarf management system with minimum floor space required when compared with competitive machines in the same price range

Principles

- Heavy swarf carried by drag type chip conveyor.
- Light & small swarf overflow through 1.5 mm & 0.5 mm filters for nozzle coolant & flushing; a final 25 μ m filter with alarm signal for 20 Bar C.T.S.
- No need to worry about coolant balance between tanks; to compensate for coolant evaporation top up by checking against an easy to read gauge.

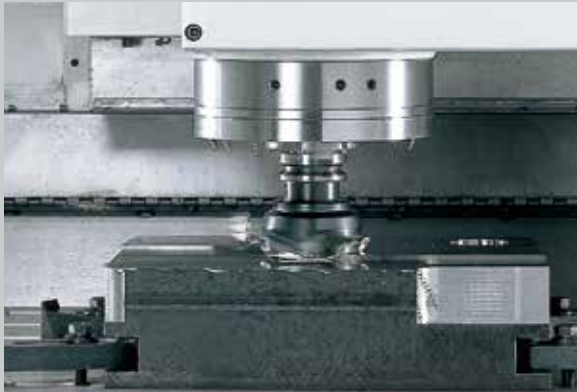




(Some covers removed for explanations)

Cutting data

FACE MILLING



MK603SP (12,000 min⁻¹)

material	ST60	ALMGSI1
Tool	ø80x6 teeth	
Spindle speed	1,000 min ⁻¹	10,000 min ⁻¹
Feed rate	1,800 mm/min	16,000 mm/min
Metal removal rate	576 cm ³ /min	2,610 cm ³ /min

END MILLING



Tool	ø45x5 teeth	
Spindle speed	240 min ⁻¹	640 min ⁻¹
Feed rate	84 mm/min	384 mm/min
Metal removal rate	101 cm ³ /min	614 cm ³ /min

DRILLING (W/C.T.S)



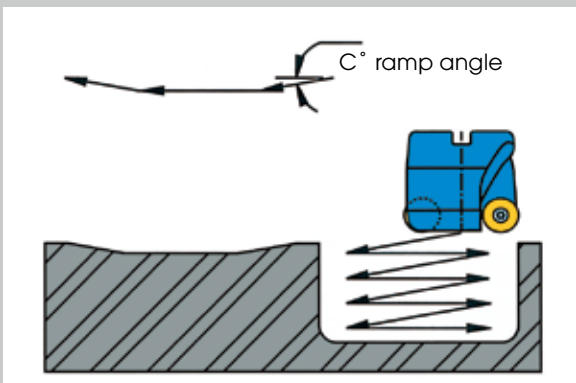
Tool	ø54x2 flutes	
Spindle speed	880 min ⁻¹	2,000 min ⁻¹
Feed rate	88 mm/min	200 mm/min

TAPPING



Tool	M36xP4.0	
Spindle speed	177 min ⁻¹	186 min ⁻¹
Feed rate	708 mm/min	744 mm/min

Steel material: heavy-duty milling



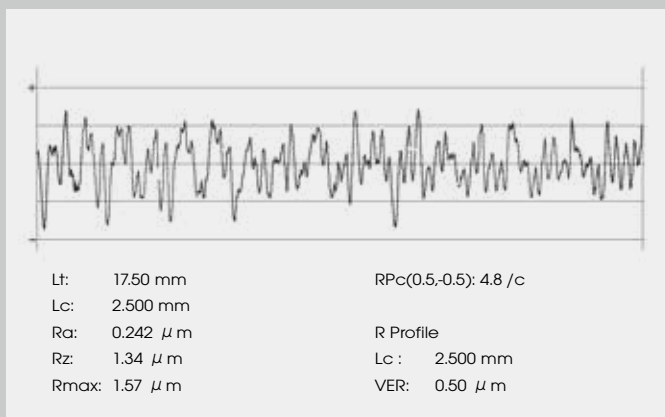
MK603SP (15,000 min⁻¹)

Material	ST60
Tool	ø80-5 teeth plunge miller
Spindle speed	765 min ⁻¹
Cutting speed	192 m/min
Cutting depth	5 mm/path
Feed rate	525 mm/min

Note: "BIG-PLUS" tool shank is needed

High Accuracy

Surface roughness : 1.57µm (R max.)

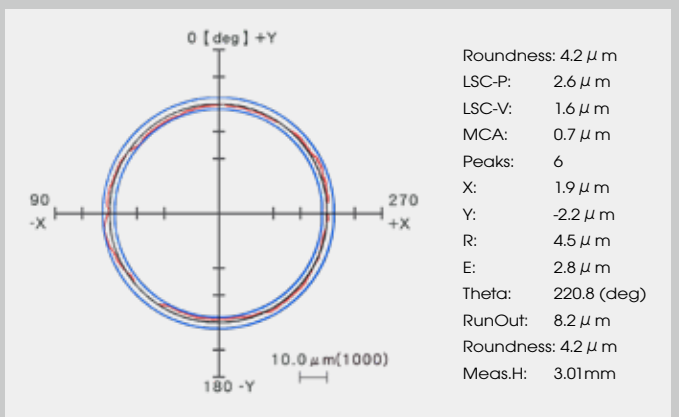


Aluminum material: high speed milling



Material	ALMGSI1
Tool	ø16 mm 2 flute end mill
Spindle speed	15,000 min ⁻¹
Cutting speed	300 m/min
Cutting depth	6,000 mm/min
Time	54 seconds

Roundness : 4.2µm



Note: The measuring results indicated in this catalog are provided as an example by random selection.

Main spindle : Heavy duty, belt drive = B Heavy duty, direct coupling = C

Technical data	MK603SE		MK603SP			
	Economic		Performance			
Spindle code	9B	12B	9B	12B	15C	20C
Work range						
Pallet size (mm)	1,050 x 550 x 2					
Max. work swing diameter (mm)	Ø1630					
Max. work piece height	350 ⁽¹⁾					
Table load capacity (kg)	300 x 2 (500 x 2 by reducing speed)					
Travel X / Y / Z (mm)	1,020 / 610 / 600					
Table surface to spindle nose (mm)	130 ~ 730					
Surface configuration	128 - M12 @ Pitch 100 grid					
Feed drive						
Feed force X (N)	6,283		8,639			
Y (N)	6,283		8,639			
Z (N)	11,520		8,639			
Rapid movement X / Y / Z (m/min)	32		32 (opt.48)			
Acceleration X / Y / Z (m/s ²)	2.7 / 3 / 3.4		4 / 5 / 5 (3.5 / 4.5 / 4.5 on 48 m/min)			
Dia. & pitch of the ball screw (mm)	Ø45 / P12		Ø45 / P16			
Accuracy Positioning / Repeatability						
ISO 230-3 / JIS	0.008 / 0.004					
JIS 6338 (300mm)	±0.003 / ±0.002					
VDI 3441	0.008 / 0.004					
Main spindle						
Spindle taper	BBT40					
Tool changer						
Tool selection	Random					
Magazine positions	48					
Max. tool diameter / No adjacent tool (mm)	Ø76.2 / Ø125					
Max. tool length (mm)	300					
Max. tool weight (kg)	7					
Tool to tool time (sec.)	2.5					
Chip to chip time (sec.) ⁽²⁾	6		6 sec @ 32 m / min; 5 sec @ 48 m / min			
Pallet changer						
Number of pallet	2					
Method of pallet changer	Swing Arm Type					
Pallet change time (sec.) ⁽²⁾	8					
Pallet changing repeatability (mm)	0.008					
Coolant system						
Coolant tank capacity (Liter)	580					
- Nozzle coolant	75 L / min; 3 bar					
- Coolant through spindle	25 L / min, 20 bar					
- Wash down	75 L / min; 3 bar					
Machine size						
Height (mm)	3,300					
Floor space W x D (mm)	3,700 x 4,795					
Weight (kg)	12,000					
Connections						
Main power	400 V / 50 Hz					
Power consumption (KVA)	35		40			

Note: ⁽¹⁾ The interference area during tool "change, please see page 17." ⁽²⁾ At 60Hz

● = Standard ○ = Option × = N/A

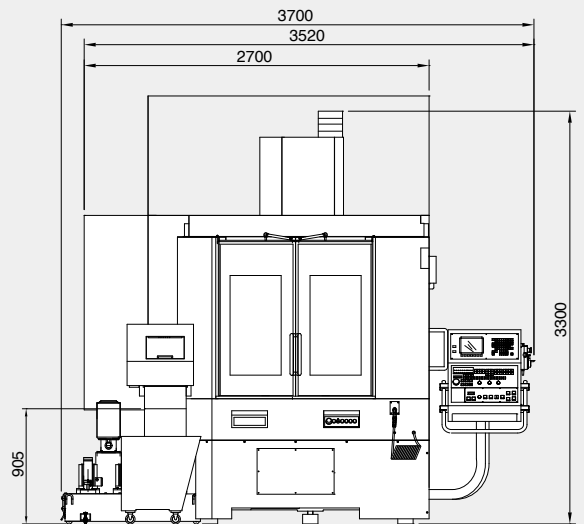
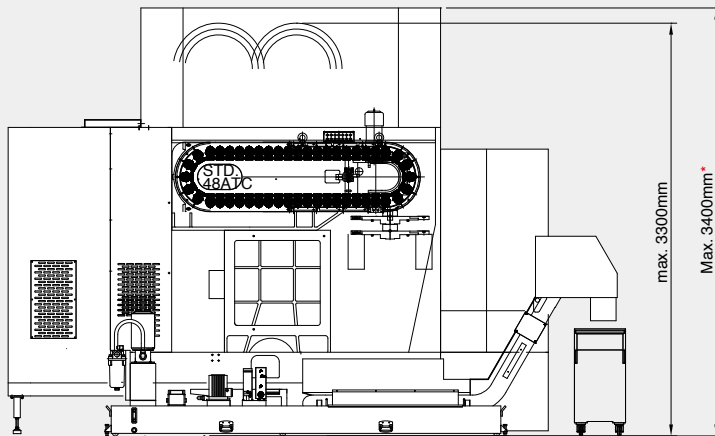
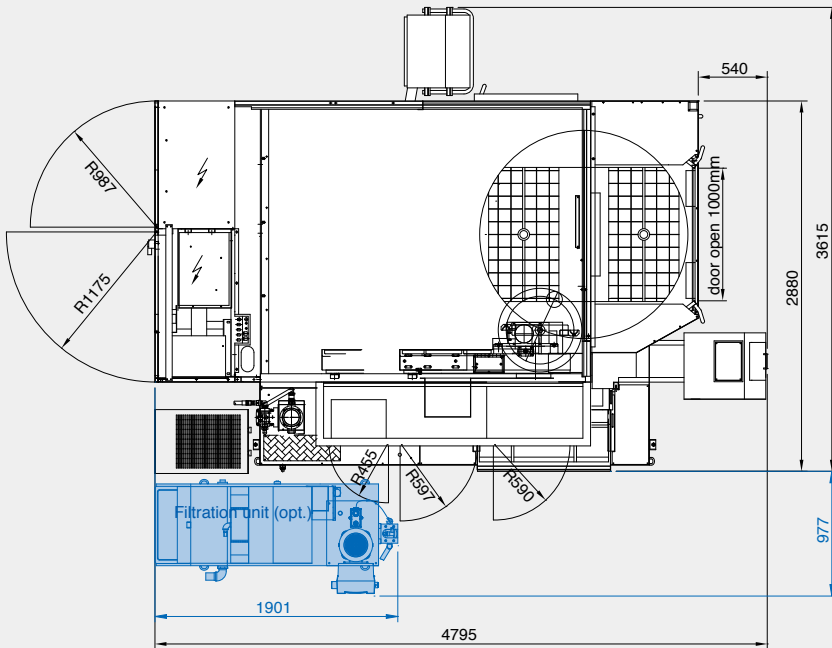
Standard / Option accessories	MK603SE		MK603SP			
	Economic		Performance			
Spindle code	9B	12B	9B	12B	15C	20C
■ QUASER mill i	○	●	×	×	×	×
AICC I	○	●	×	×	×	×
■ Mold machining pack (R660)	○	○	×	×	×	×
AICC II (Lock-ahead 200 blocks)	○	○	×	×	×	×
Smooth tolerance control	○	○	×	×	×	×
Jerk control	○	○	×	×	×	×
Machining quality level adjust function	○	○	×	×	×	×
FANUC – data server	○	○	×	×	×	×
■ FANUC 31IB	×	×	○	●	○	○
AICC II (Lock-ahead 200 blocks)	×	×	○	●	○	○
FANUC – data server	×	×	○	○	○	○
FANUC – high speed processing (Lock-ahead 600 blocks)	×	×	○	○	○	○
■ Oil chiller	●	●	●	●	●	●
■ 48 m / min rapid ⁽³⁾	×	×	○	○	○	○
■ 40 Taper 48 position tool magazine	●	●	●	●	●	●
■ Tooling - BT40	●	●	●	●	●	●
- ISO40	○	○	○	○	○	○
- DIN40	○	○	○	○	○	○
- HSK A63	×	×	×	×	○	○
■ Pull stud for BT tooling	●	●	●	●	●	●
■ Balance tooling for spindle warm up	●	●	●	●	●	●
■ BBT spindle attachment (Double contact)	●	●	●	●	●	●
■ 2 pallet station	●	●	●	●	●	●
■ Tool length / breakage measurement	○	○	○	○	○	○
■ Linear encoder	○	○	○	○	○	○
■ Coolant system	●	●	●	●	●	●
■ Coolant through spindle 20 bar	●	●	●	●	●	●
■ Coolant through spindle 50 bar	○	○	○	○	○	○
■ Saddle wash down coolant	●	●	●	●	●	●
■ Coolant wash gun	●	●	●	●	●	●
■ Chip augers	●	●	●	●	●	●
■ Cutter air blast	●	●	●	●	●	●
■ Chip conveyor	●	●	●	●	●	●
■ Filtration unit	○	○	○	○	○	○
■ Documentation (CD-ROM) ⁽⁴⁾	●	●	●	●	●	●
■ Work light	●	●	●	●	●	●
■ Machine status light	●	●	●	●	●	●
■ CE & EMC ⁽⁵⁾	○	○	○	○	○	○
■ Top cover	○	○	○	○	○	○

Note: ⁽³⁾ The linear encoder is standard item for rapid traverse as 48 m/min model. ⁽⁴⁾ Paper documentation is option

⁽⁵⁾ Standard for Europe area.

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

Installation dimension



* With top cover (option)

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**QUASER MACHINE TOOLS,
INC.**

Address: No. 3, Gong 6th Rd.,
Youshih Industrial
Park, Dajia Dist,
Taichung City 437,
Taiwan
Tel: +886 4 26821277
Fax: +886 4 26822045
E-mail: sales@qmt.com.tw
Web: www.quaser.com

**QUASER EUROPE TECHNIC
CENTER - SWITZERLAND**

Address: Unterlettenstrasse
16, CH- 9443 Widnau
Switzerland
Tel: +41 71 722 43 43
Mobile phone: +41798229028
E-mail: qe@qmt.com.tw

**KUNSHAN QUASER
MACHINE TOOLS, INC.**

Address: (B) No. 287,
Kangzhuang Road,
Zhoushi Town,
Kunshan City,
Jiangsu, P.R. China
Tel: 0512-82627139
Fax: 0512-82627138
E-mail: qmtc@qmt.com.tw

**QUASER AMERICA MACHINE
TOOLS INC.**

Address: 3049 Southcross
Boulevard, Rock Hill,
SC, 29730, UNITED STATES
Tel: +1 803-324-7123
Fax: +1 888-459-8175
E-mail: qa@qmt.com.tw

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