

QUASER

we cut faster

MT400U SERIES

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High Speed 5-Axis Mill-Turn Machining Center

SIEMENS = (S) HEIDENHAIN = (T)

Motor power	MT400U	
Spindle code	12C	15C
X / Y / Z (kW)	S	2.7 / 2.7 / 4.9
	T	5.1 / 5.4 / 5.4
A / C (kW)	S	3.3 / 20 (Turning mode)
	T	4.5 / 20

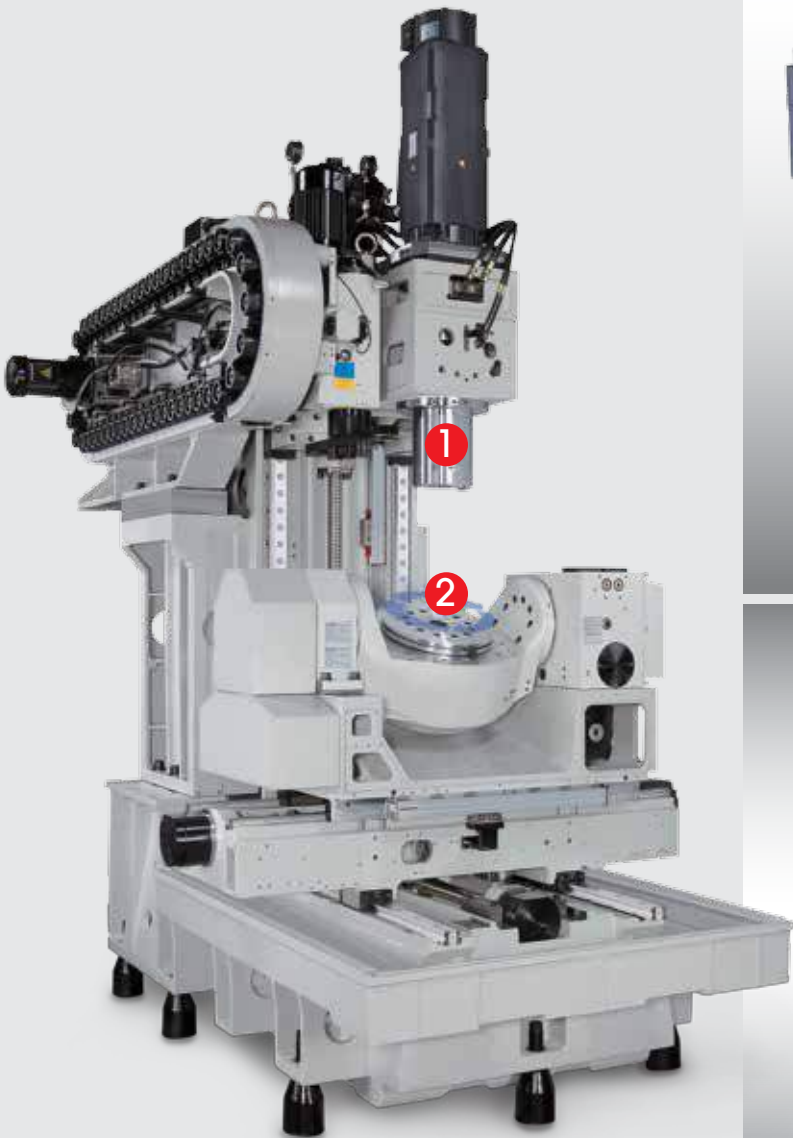


1 Milling spindle

- 12,000 min⁻¹
- 15,000 min⁻¹
- 16.5 kW / 79 Nm (S6-40%)

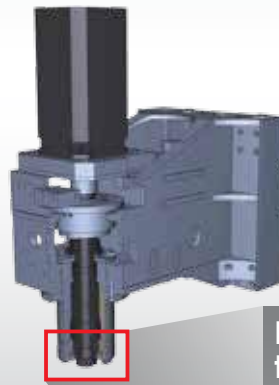
2 Turning table (C axis / S2)

- 100 min⁻¹ / 1,200 min⁻¹
- 17 kW / 360 Nm (S6-40%)



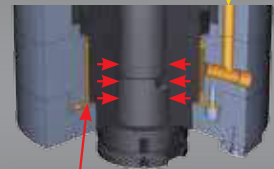
Spindle index & lock function

- Spindle is capable of indexing at any degree to satisfy multi-edge turning tool application.
- Spindle locking (350 Nm) function for turning tool cutting.

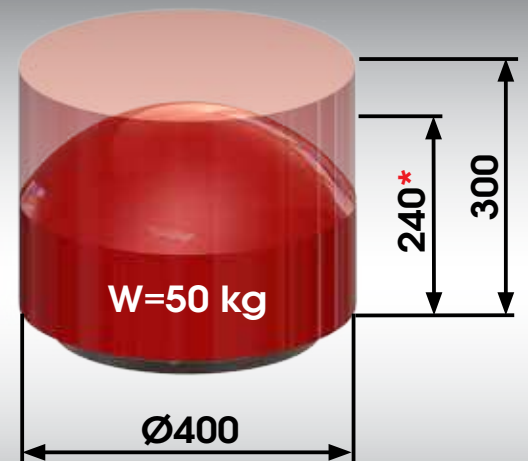


Drum Brake system by the oil pressure supply

Hydraulic Unit



Drum Brake system



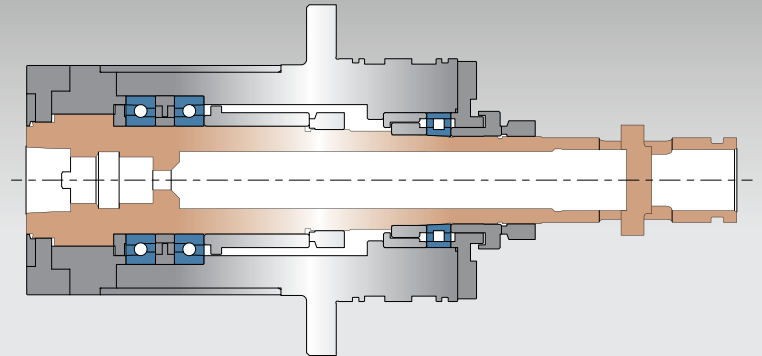
Note: *While using the max. tool length as 280mm, the height of workpiece is limited as 240mm.

Spindle system

Main milling spindle

Transmission: Coupling

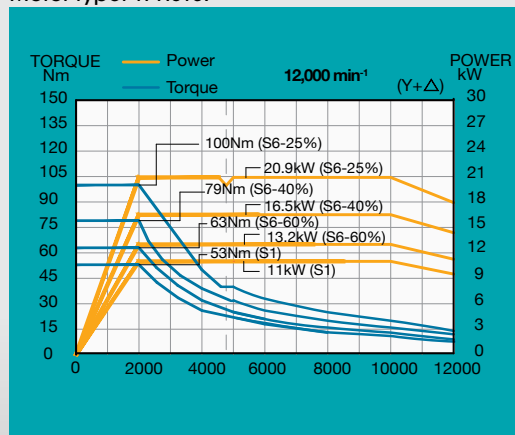
- Speed range: 12,000min⁻¹
Grease packed system
- Speed range: 15,000min⁻¹ (opt.)
Re-grease system



MC-4.2

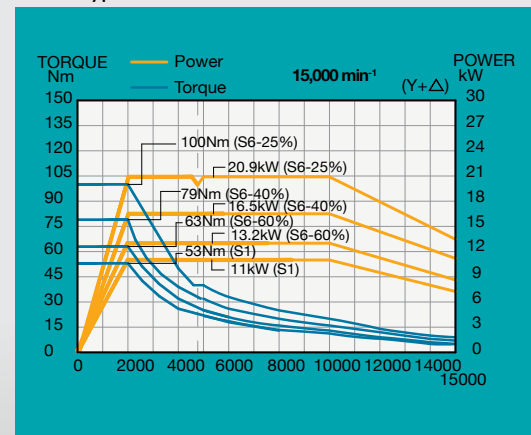
Coupling
Motor type: 1PH8107

SIEMENS

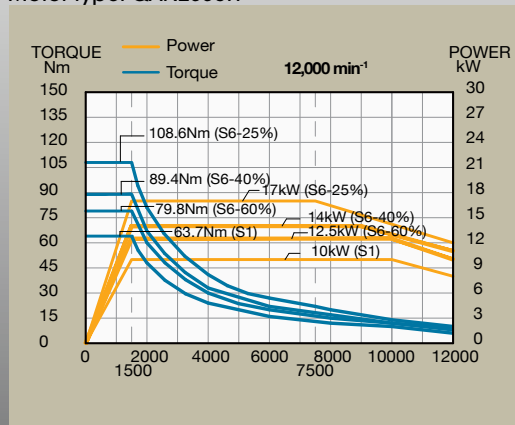


MC-4.3R

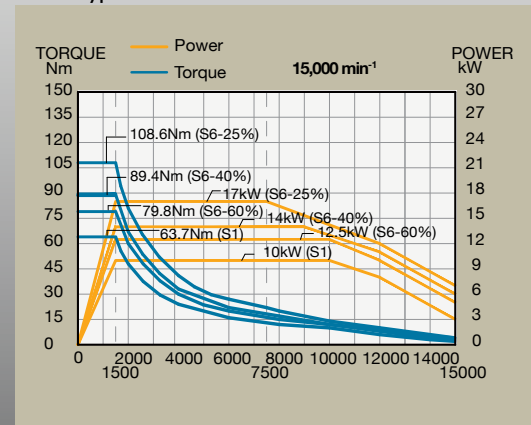
Coupling
Motor type: 1PH8107



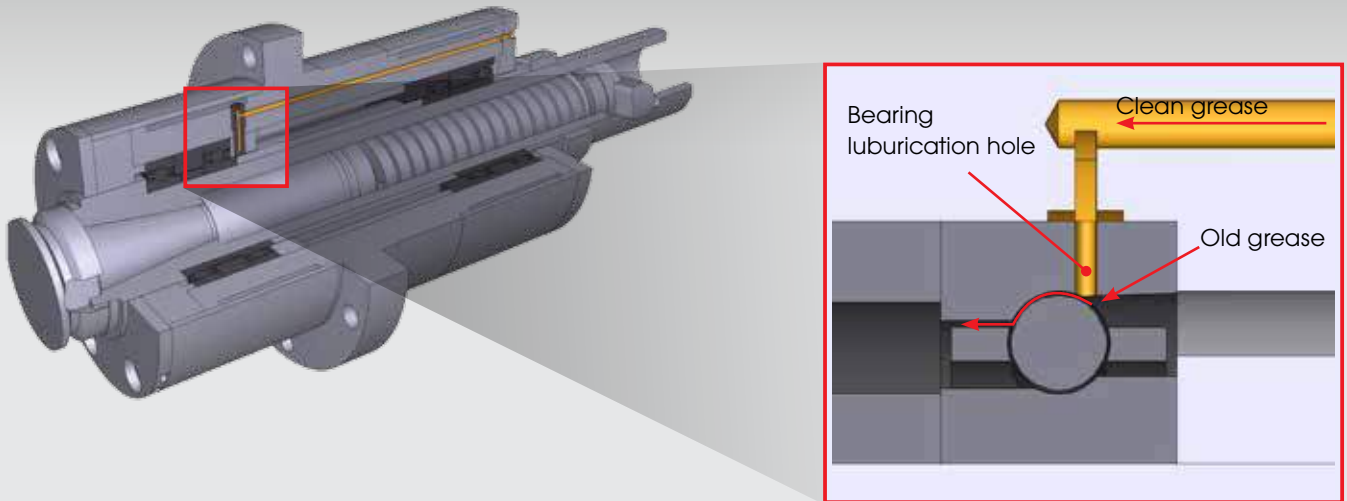
Coupling
Motor type: QAN200UH



Coupling
Motor type: QAN200UH



The lubrication concept illustration of grease supply



Thermal solution

- 1 Motor mounting block cooling
- 2 The spindle cooling system uses oil cooling and water jacket device to give the right amount of coolant to all the bearings



Headstock thermal control X,Y & Z $\pm 10\mu\text{m}$



Two axes table (4/5 axis)

Main turning spindle

Work envelope		MT400U	
		Rotary Axis (C-axis) C axis = Milling mode S2 = Turning mode	Tilting Axis (A-axis)
Max. swing (mm)		Ø400	
Table load capacity (kg)		50	
Allowable loading inertia (kg.m ²)		0.64	
Maximum R.P.M (min ⁻¹)		C axis = 100 S2 = 1,200	25
Indexing accuracy (sec.)		20 (10)	20 (10)
Repeatability (sec.)		6 (4)	8 (4)
Clamping torque (Nm)		700	1400
Allowable cutting torque (Nm)	S1/S6-40%	271 (466rpm) / 357 (373rpm)	-

Note: () with absolute rotary encoder.

Torque motor advantages

- High speed
- High dynamics
- High accuracy
- Optimal speed control
- Compact design
- Wear free



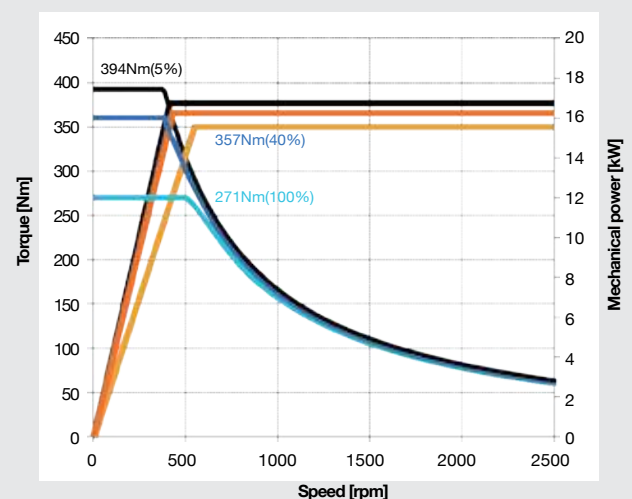
Cooling circuit



Manual 3-Jaw chuck (opt.)



Torque and mechanical power



ATC system

Tool Specification

Turning tool: HSK T63

Milling tool: HSK A63

Magazine positions: 48 (std.)

60 (opt.)

120 Dual magazine (opt.)



Tool changer

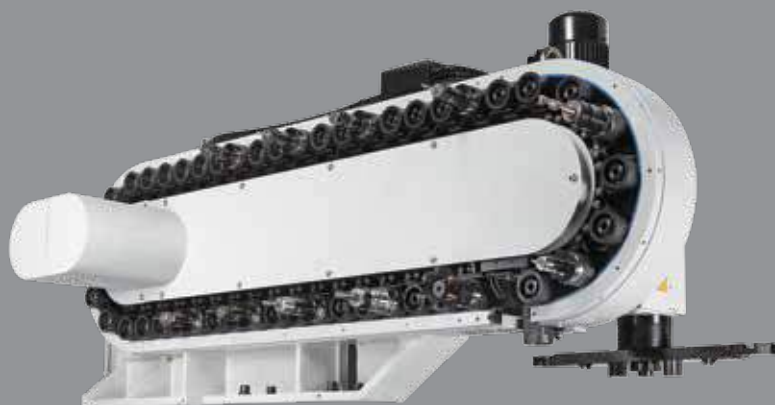
Tool to tool time : 1.6 sec.*

Chip to chip time : 6 sec.*

Max. tool diameter: $\varnothing 76.2$ mm

Max. tool length: 280 mm

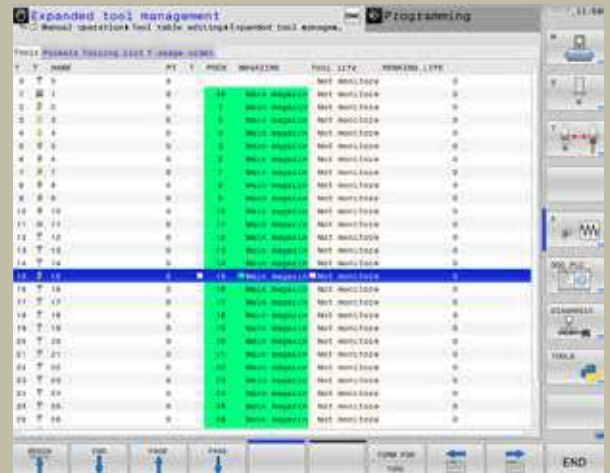
Max. tool weight: 7 kg



Note: * At 60 Hz

Expanded tool management

Machine NC system



Tool measuring system:

Laser: milling tool



Mechanical: Turning tool



Milling



Turning



Expanded tool management

Information

NAME: 11

DOC: TP_00

P: 1.11

BT: TYP: MILL_TOOL

Basic data

ST	1	D	11	R	0.0000
T	1	D	11	R	0.0000
T	1	D	11	R	0.0000
T	1	D	11	R	0.0000

Additional data

Tool life data

PLC data

APL: T_1-OPFD

ADAPTIVE: T_4-OPFD

APL-LOAD: T_1700

LAST USE: 18.08.08 08:37:30

LEFTOFF: T_0000

Buttons: TOOL, INFO, HELP, END

Expanded tool management

Information

NAME: 11

DOC: TP_00

P: 1.11

BT: TYP: TURN

Basic data

ST	1	D	11	R	0.0000
T	1	D	11	R	0.0000
T	1	D	11	R	0.0000
T	1	D	11	R	0.0000

Additional data

Tool life data

PLC data

APL: T_1-OPFD

ADAPTIVE: T_4-OPFD

APL-LOAD: T_1700

LAST USE: 18.08.08 08:37:30

LEFTOFF: T_0000

Buttons: TOOL, INFO, HELP, END

Tool list

Loc.	Type	Tool name	ST	D	H	Length	Radius	Flag	Inc.
34	34		1	1	0	0.000	0.00		CUTTER
35	35		1	1	0	0.000	0.00		CUTTER
36	36		1	1	0	0.000	0.00		CUTTER
37	37		1	1	0	0.000	0.00		CUTTER
38	38		1	1	0	0.000	0.00		CUTTER
39	39		1	1	0	0.000	0.00		CUTTER
40	40		1	1	0	0.000	0.00		CUTTER
41	41		1	1	0	0.000	0.00		CUTTER
42	42		1	1	0	0.000	0.00		CUTTER
43	43		1	1	0	0.000	0.00		CUTTER
44	44		1	1	0	0.000	0.00		CUTTER
45	45		1	1	0	0.000	0.00		CUTTER
46	46		1	1	0	0.000	0.00		CUTTER
47	47		1	1	0	0.000	0.00		CUTTER
48	48		1	1	0	0.000	0.00		CUTTER
49	CUTTER		1	1	0	0.000	0.00		CUTTER
50	ROUGHING_TOOL		1	1	0	0.000	0.000		ROUGHING_TOOL

Tool details for CUTTER

Flag: No. Dr: 1 0 1

Tool state: Normal 1 1

Tool size: Normal 1 1

Tool DE1 parameter 1: 0.000

Tool DE1 parameter 2: 0.000

Buttons: Tool list, Tool wear, Phase size, Work offset, User variable, Setting data, Back

Tool list

Loc.	Type	Tool name	ST	D	H	Length	Length X	Radius	Flag	Inc.
34	34		1	1	0	0.000	0.00	0.00		ROUGHING_TOOL
35	35		1	1	0	0.000	0.00	0.00		ROUGHING_TOOL
36	36		1	1	0	0.000	0.00	0.00		ROUGHING_TOOL
37	37		1	1	0	0.000	0.00	0.00		ROUGHING_TOOL
38	38		1	1	0	0.000	0.00	0.00		ROUGHING_TOOL
39	39		1	1	0	0.000	0.00	0.00		ROUGHING_TOOL
40	40		1	1	0	0.000	0.00	0.00		ROUGHING_TOOL
41	41		1	1	0	0.000	0.00	0.00		ROUGHING_TOOL
42	42		1	1	0	0.000	0.00	0.00		ROUGHING_TOOL
43	43		1	1	0	0.000	0.00	0.00		ROUGHING_TOOL
44	44		1	1	0	0.000	0.00	0.00		ROUGHING_TOOL
45	45		1	1	0	0.000	0.00	0.00		ROUGHING_TOOL
46	46		1	1	0	0.000	0.00	0.00		ROUGHING_TOOL
47	47		1	1	0	0.000	0.00	0.00		ROUGHING_TOOL
48	48		1	1	0	0.000	0.00	0.00		ROUGHING_TOOL
49	CUTTER		1	1	0	0.000	0.00	0.00		CUTTER
50	ROUGHING_TOOL		1	1	0	0.000	0.000	0.000		ROUGHING_TOOL

Tool details for ROUGHING_TOOL

Flag: No. Dr: 1 0 1

Tool state: Normal 1 1

Tool size: Normal 1 1

Tool DE1 parameter 1: 0.000

Tool DE1 parameter 2: 0.000

Buttons: Tool list, Tool wear, Phase size, Work offset, User variable, Setting data, Back

NC - (PROGRAM) TEST001.M

1. TOOL CALL 181

2. TOOL PRGMP AND TOOL SETTING 11.1.2

3. TOOL CALL 181.1

4. TOOL PRGMP AND TOOL SETTING 11.1.2

5. TOOL CALL 181.2

6. TOOL PRGMP AND TOOL SETTING 11.1.2

7. END PROGRAM TEST001.M

Active PMB: TNC (PROGRAM) TEST001.M

Buttons: Stop, Start, Feed, etc.

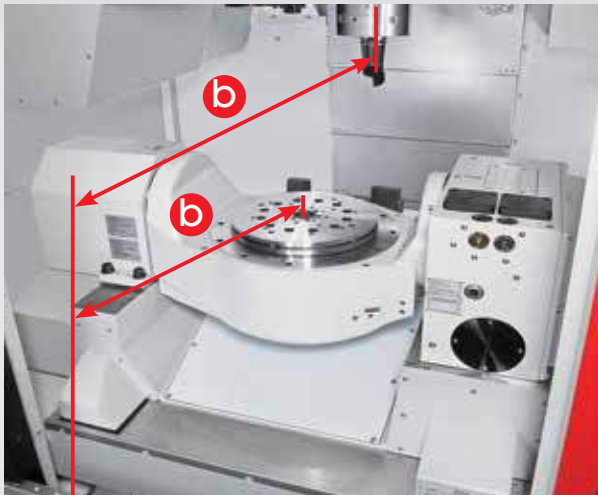
TNC (PROGRAM) TEST001.M

ST	D	H	Length	Length X	Radius	Flag	Inc.
34	34		1	1	0	0.000	0.00
35	35		1	1	0	0.000	0.00
36	36		1	1	0	0.000	0.00
37	37		1	1	0	0.000	0.00
38	38		1	1	0	0.000	0.00
39	39		1	1	0	0.000	0.00
40	40		1	1	0	0.000	0.00
41	41		1	1	0	0.000	0.00
42	42		1	1	0	0.000	0.00
43	43		1	1	0	0.000	0.00
44	44		1	1	0	0.000	0.00
45	45		1	1	0	0.000	0.00
46	46		1	1	0	0.000	0.00
47	47		1	1	0	0.000	0.00
48	48		1	1	0	0.000	0.00
49	CUTTER		1	1	0	0.000	0.00
50	ROUGHING_TOOL		1	1	0	0.000	0.000

Buttons: Stop, Start, Feed, etc.

Easy operation

- a** Max. size when operator door open 870 mm
- b** From center of table to operator door 605 mm
- c** Swivel type operation panel & Hand held remote MPG



Application sample



Coolant system & Chip management



- a** Coolant tank: 300 Liter
- b** Coolant through spindle: 20 bar
- c** Nozzle coolant: 3.5 bar
- d** Wash down: 3.5 bar
- e** Wash gun





Control: (T) = HEIDENHAIN (S) = SIEMENS

Technical data		MT400U	
Spindle code		12C	15C
Work range			
Table size (mm)		Ø320	
Travel	X / Y / Z (mm)	410 / 610 / 510	
	A (degree)	+30° ~ -120°	
	C / S2 (degree)	360° (Continuous)	
Max. swing (mm)		Ø400	
Table surface to spindle nose (mm)		20 ~ 530	
Spindle nose to tilting center at 90°		20 ~ 530	
Max. work piece size (mm)		Ø400 x 300	
Table load capacity (kg)		50	
Allowable loading inertia (kg · m²)		0.64	
Feed drive			
Feed force	X / Y / Z (N)	11,300 / 13,700 / 13,700 (T) 6,283 / 6,283 / 14,137 (S)	
Rapid movement	X / Y / Z (m / min)	36 / 36 / 36	
	A / C (min ⁻¹)	A=25 / C=100 (Turning mode S=1,200)	
Acceleration	X / Y / Z (m/s²)	5 / 4 / 5 (T) 4 / 3.5 / 4 (S)	
Dia. & pitch of the ball screw (mm)		Ø45 / P=12 / 12 / 12	
Accuracy Positioning / Repeatability			
ISO 230-2		0.008 / 0.004	
JIS 6338 (300 mm)		±0.003 / ±0.002	
VDI3441		0.008 / 0.004	
Main spindle			
Spindle taper		HSK T63 (HSK A63)	
Max. spindle speed		12,000	15,000
Spindle base speed	T / S	1,500 / 2,000	1,500 / 2,000
Spindle power output kW (S6-40%)	T / S	14 / 16.5	14 / 16.5
Spindle torque output Nm (S6-40%)	T / S	89.4 / 79	89.4 / 79
Spindle transmission		Coupling	
Spindle bearing diameter (mm)		Ø80	
Tool changer			
Tool selection		Random pocket, bidirectional selection	
Magazine positions		48 (std.)	60 / 120 (opt.)
Max. tool diameter (mm)		76.2	
Max. tool diameter w/o adjacent tool (mm)		125	
Max. tool length (mm)		280	
Max. tool weight (kg)		7	
Tool to tool time (sec.) ⁽¹⁾		1.6	
Chip to chip time (sec.) ⁽¹⁾		6	
Coolant system			
Coolant tank capacity (Liter)		300	
Pump capacity ⁽¹⁾			
- Nozzle coolant		75L / min., 3.5 bar	
- Through spindle coolant		25L / min , 20 bar	
- Wash down		75L / min., 3.5 bar	
Machine size			
Height (mm)		3,180	
Floor space W x D (mm)		3,211 x 2,910	
Net Weight (kg)		7,360 (48ATC)	
Connections			
Main power		220V / 60Hz or 400V / 50Hz	
Power consumption (KVA)		47 (T) 43.1 (S)	

Note: ⁽¹⁾At 60Hz

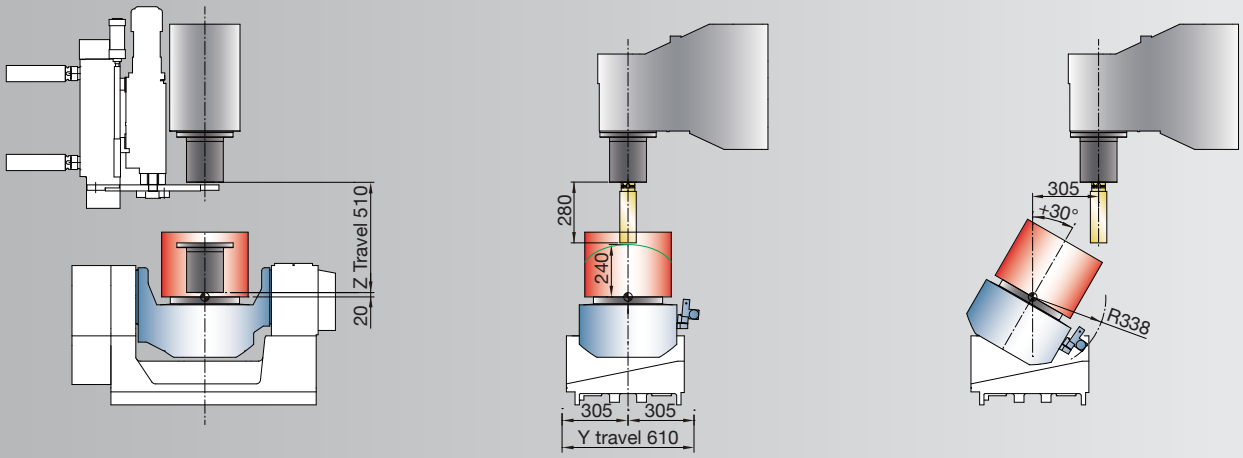
● = Standard ○ = Option ✕ = N/A

Standard / Option accessories	MT400U	
	12C	15C
Spindle code		
■ HEIDENHAIN TNC640	●	●
■ SIEMENS840D	○	○
■ Oil chiller	●	●
■ 12,000 min ⁻¹ coupling	●	✕
■ 15,000 min ⁻¹ coupling	✕	●
■ 48 position tool magazine	●	●
■ 60 position tool magazine	○	○
■ 120 position tool magazine (Dual magazine)	○	○
■ Balance tooling for spindle warm up	○	●
■ ATC auto door	●	●
■ Manual 3-Jaw chuck	○	○
■ Work probe receive*	●	●
■ Work probe	○	○
■ Thermal compensation	●	●
■ Tool length / breakage measurement (Laser) + for both milling & turning tool	●	●
■ Hydraulic through pallet (3 ports)	●	●
■ X / Y / Z linear scale	○	○
■ Rotary encoder on A axes & C axes (RCN2380)	●	●
■ Coolant through ball screw	●	●
■ 20 bar through spindle coolant	●	●
■ Coolant wash gun	●	●
■ Coolant wash down	●	●
■ External chip conveyor (hinge type)	●	●
■ Cutter air blast	●	●
■ Oil-mist collector	○	○
■ Bag filtration	○	○
■ Filtration unit	○	○
■ Documentation**	○	○
■ Work light	●	●
■ Machine status light	●	●
■ CE & EMC ***	○	○

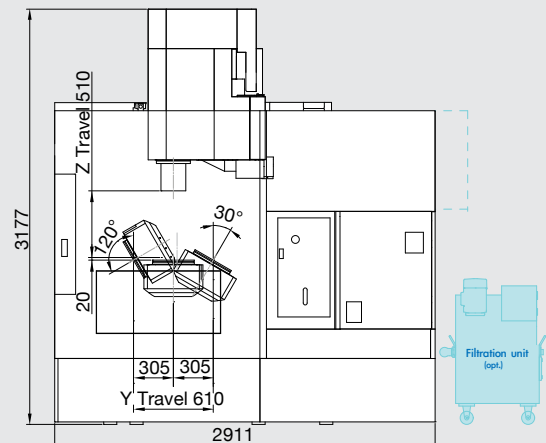
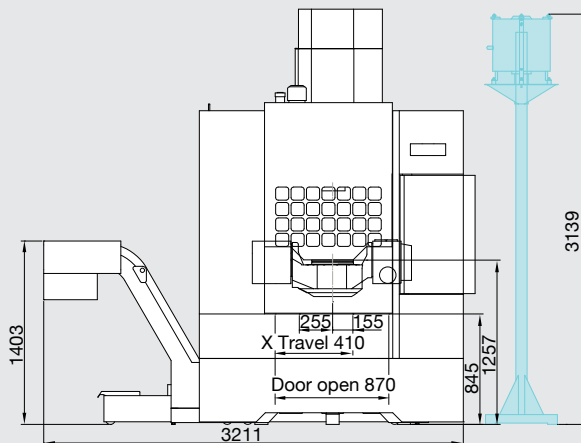
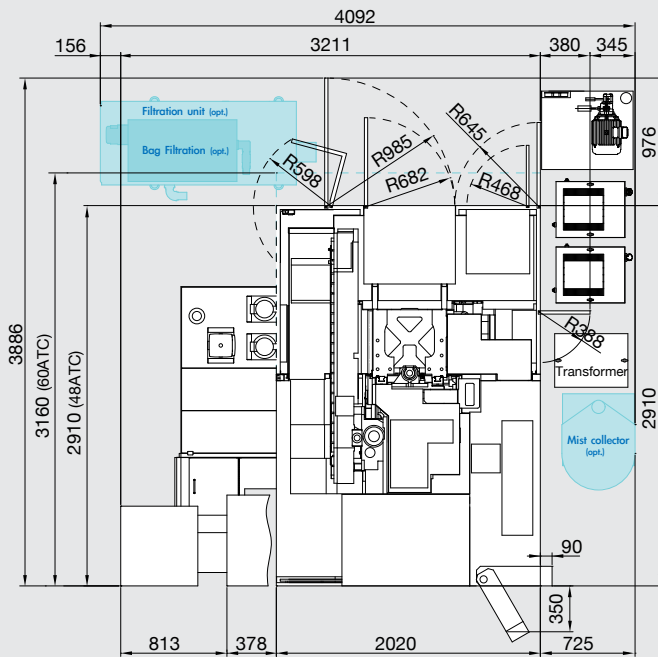
Note: * Receive OMI-2T ** By CD-ROM version. *** Standard for EU area.

- Machine specification might be different form the catalogue if there any specification update.

Cutting area and interference



Installation dimension



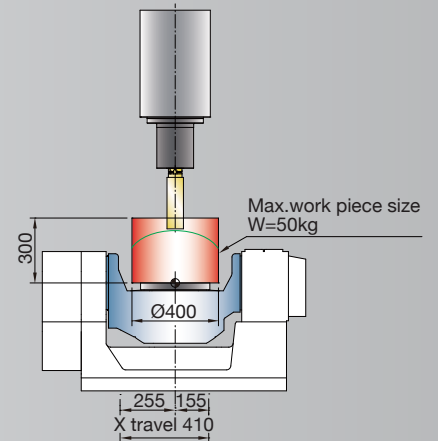
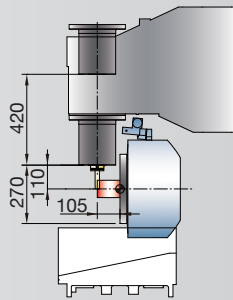
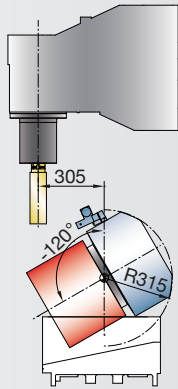
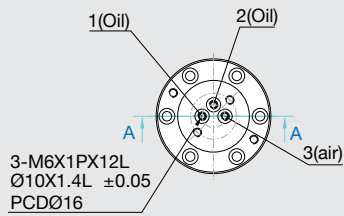
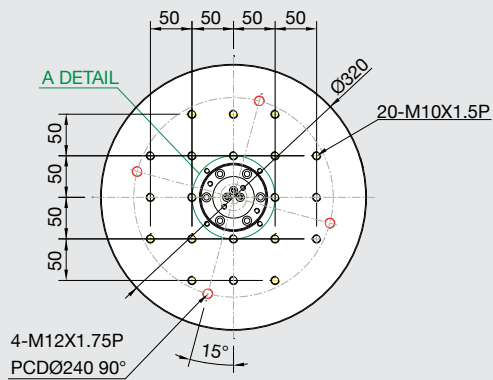
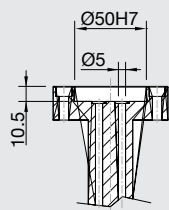


Table dimension



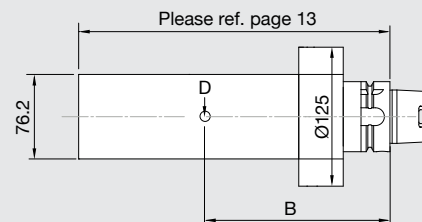
A DETAIL
(3 port)



A-A SECTION

Applicable tools

B	tool median point distance
D	tool weight
MOMENT=D*B (≦9.85N-m)	



HSK A63 & HSK T63
(ICTM, ISO12164-3/4)

We build machines in a hybrid way

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

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