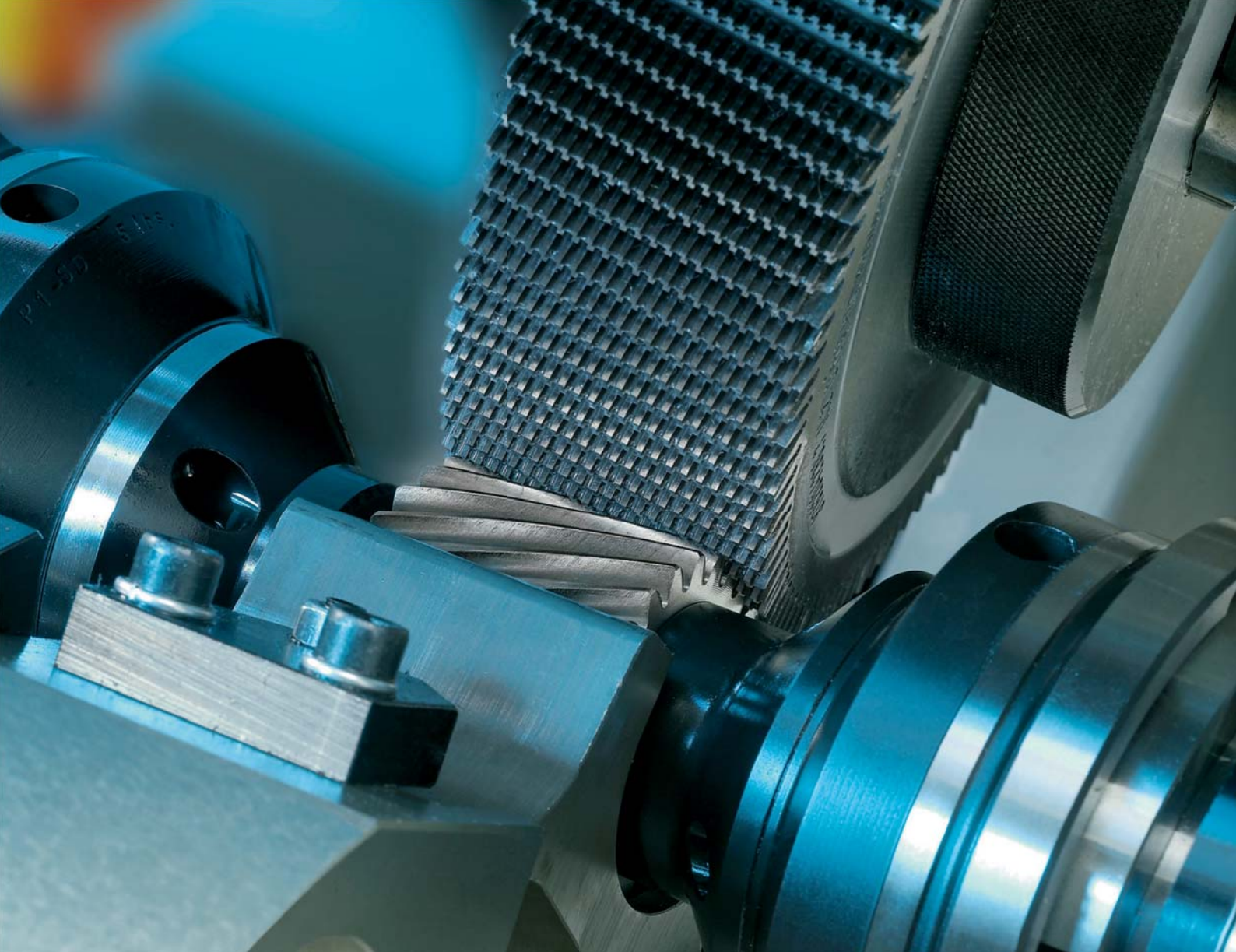


Gear Shaving Machines
RASO Series



perfect shaving

SICMAT, a brand of Samputensili, started as a Machine Tools Manufacturer in 1932 and has been focusing on gear shaving machines and shaving technology for several decades.

Gear manufacturers know well that in gear shaving the whole process need to be carefully controlled: machines, cycles, tools, fixtures, automation, etc.

Thanks to our complete range of machines, to our competence and to our specialization, we can significantly improve the performance and quality of your shaving process.

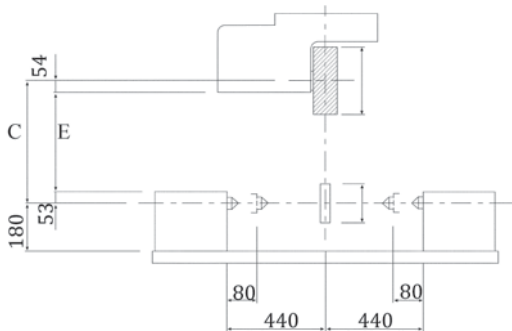
RASO 200 compact speed

Thanks to its “lathe-like” structure and its compact design, RASO 200 has the same stiffness of larger machines. Cycle speed and flexibility are at the top.

The RASO 200 machine is the ideal match for automatic transmission gears, motorcycle gears, pump gears. It is available in 3, 5 and 7 controlled axes configuration (modular concept).



Raso 200 with loader

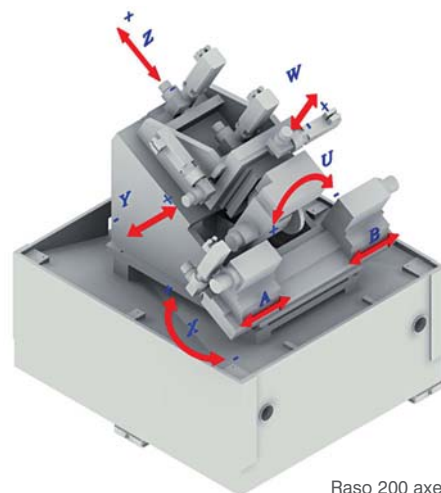


Raso 200 working zone



	min	min
C	110	202
E	3	95

Ø Shaving Cutter		Ø Workpiece	
"	mm	min	max
7"	177,8	43,5	226
8"	203,2	18	200
9"	228,6	0	175
	245	0	159



Raso 200 axes scheme

RASO 400 versatile power

Because of its large, open “C” structure, RASO 400 is the most versatile shaving machine.

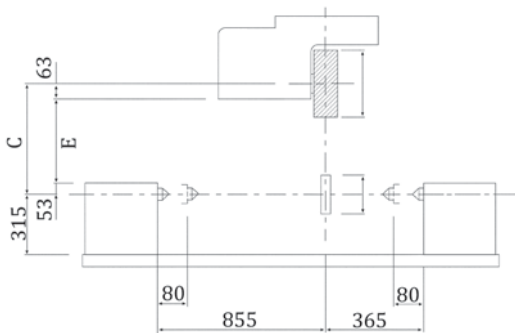
It can shave gears in very different sizes, even big gears and long shafts. Different types of automation, as well as auxiliary units, are available: chamfering/deburring, oil spin off, marking, a.s.o.

RASO 400 is the right solution both for mass production and for small/medium batches.

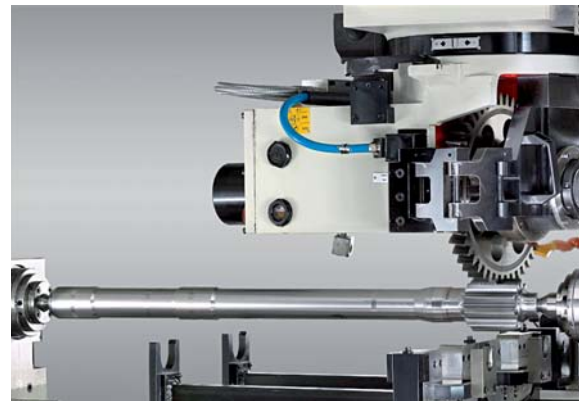
It is available in 4, 5 and 7 controlled axes configuration (modular concept).



Raso 400 with adatto 5 loader

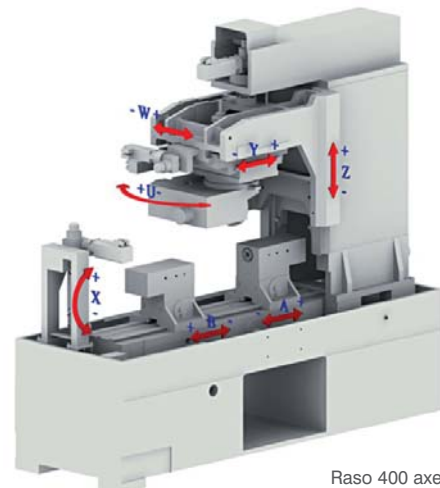


Raso 400 working zone



	min	min
C	119	329
E	3	213

Ø Shaving Cutter		Ø Workpiece	
"	mm	min	max
8"	203,2	40	454
9"	228,6	15	429
10"	254	0	404



Raso 400 axes scheme

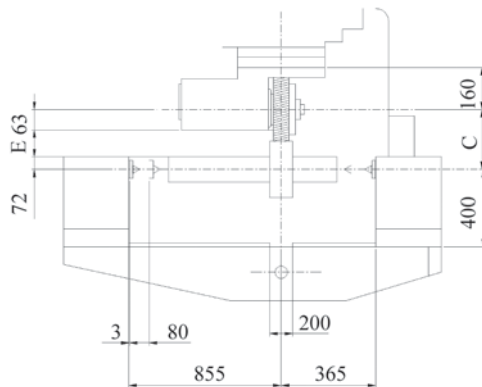
RASO 600 heavy duty

With a weight of 9 tons, RASO 600 is the heaviest and most rigid shaving machine.

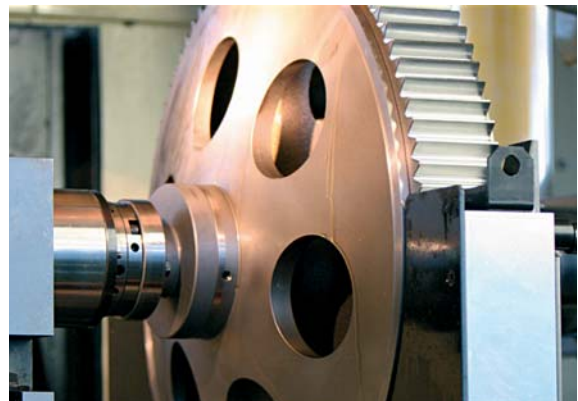
Because of its power and stiffness, RASO 600 is the ideal machine for gears with large modules and face widths, such as those for tractors, earthmovers, and industrial gears. Chamfering/deburring operation can be integrated as an option. Available in 5 and 7 controlled axes configuration.



Raso 600 with adatto 1 loader

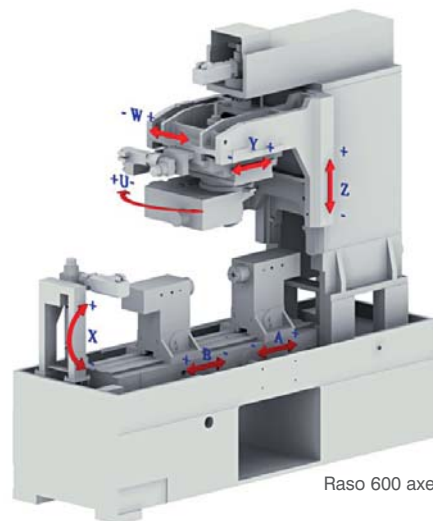


Raso 600 working zone



	min	min
C	227	437
E	92	302

Ø Shaving Cutter		Ø Workpiece	
"	mm	min	max
8"	203,2	256,8	676,8
9"	228,6	231,4	651,4
10"	254	206	626



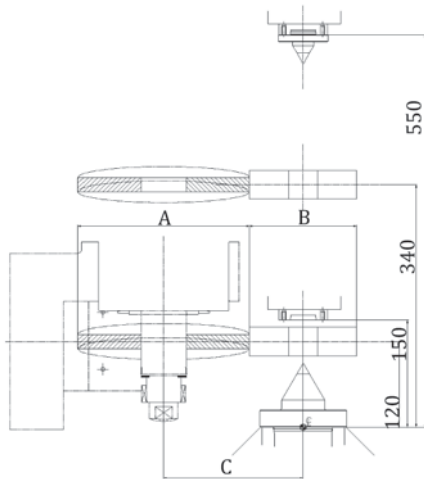
Raso 600 axes scheme

RASO 250 TP state of art for twin power shaving

The main features of Raso 250 TP are modular concept and construction, exceptionally high rigidity, synchronized tool/workpiece axes, easy access-ibility for maintenance and operation, 9 or 10 CNC controlled axes, integrated automation, simultaneous auxiliary operations (chamfering, deburring), vertical workpiece axes, cross slide with linear motors, electro-spindles, workpiece centrifugation.



Raso 250 TP

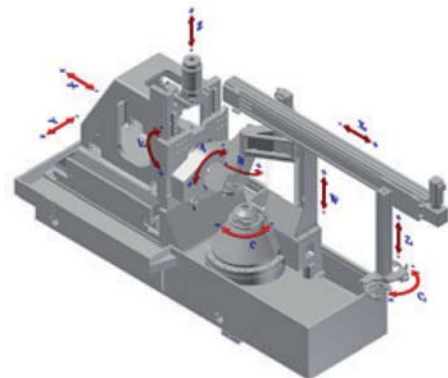


Raso 400 working zone



	min	min
C	120	450

Ø Shaving Cutter		Ø Workpiece	
"	mm	min	max
8"	203,2	45	250
9"	228,6	20	250
10"	254	0	250
	260	0	250



Raso 250 TP axes scheme

Software friendly power

By means of a powerful and friendly software, you can easily get excellent results. Sicmat software has been improved over more than 20 years to provide excellent machine performance and ease of operation.

Shaving cycles:

- + parallel
- + diagonal with progressive crowning
- + broken diagonal
- + underpass
- + plunge
- + mixed cycles: plunge plus parallel, plunge plus underpass
- + special combined double cycles (also with head with double cutter)

The broken diagonal cycle can be split up into three segments. Each segment can be crowned and/or tapered differently, thus obtaining special and a-symmetrical leads (e.g. to pre-compensate thermal distortions). Here are some examples of leads obtainable with broken diagonal cycle:



Fig.1 Crowning more stressed at the ends.



Fig.2 More crowning at the ends and tapering correction.

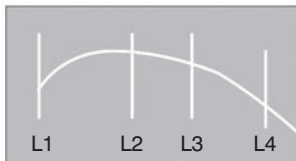


Fig.3 Asymmetrical crowning with varied

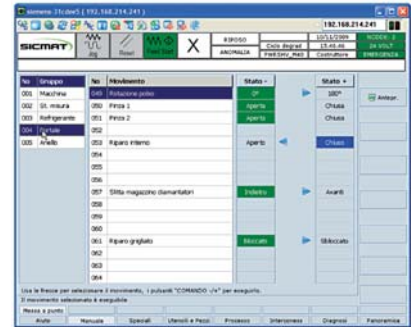


Fig.4 Double tapering or parallel plus conical.

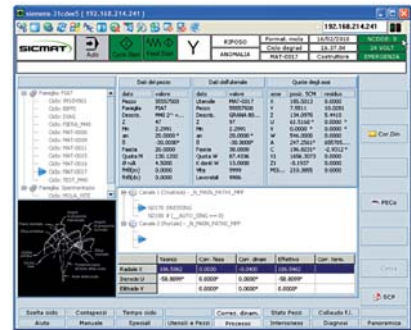
Software features:

- + parallel, transverse and taper & crown axes in simultaneous interpolation
- + dynamic calculation of radial and lead axes and automatic repositioning after shaving cutter sharpening
- + calculation for the lead and/or tapering correction
- + automatic compensation of thermal expansion
- + dynamic check of the input data
- + advanced troubleshooting (alarms, messages, comments)
- + dynamic correction direct transfer from measuring system (optional)
- + calculation of theoretical cycle on the machine (optional)
- + assistance to maintenance (optional)
- + standard operator client interface "Transline" (optional)
- + teleservice (optional)

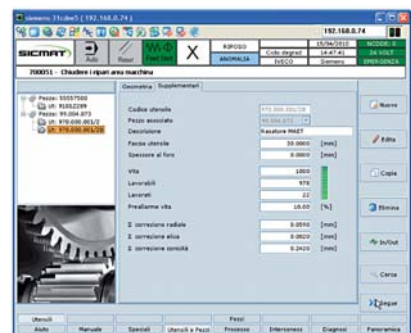
The standard numeric controls are SIEMENS 840 D. All encoders are absolute type.



Software page - manual movements



Axes position & total dynamic correction

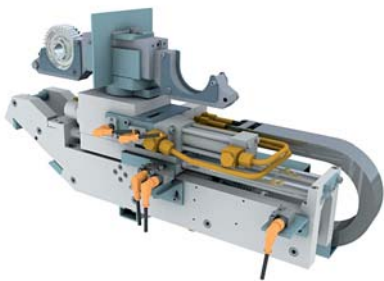


Tools data

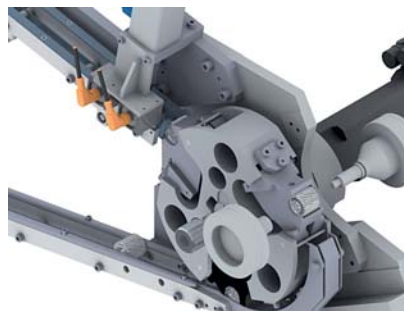
Automatic loaders reliable productivity

A range of 7 automatic loaders guarantees high cycle speed and reliability. With the appropriate loader, the shaving machines can be easily connected/integrated in automated lines or cells.

Machines	Loader	Work Piece Type	Indicative Performance (diam. - length)			Description	Layout
			Gears diam. (mm)	Shaft leght (mm)	H Tailstocks (mm)		
RASO 200	Adatto 6	gears/shafts	130	125+125	180	double hand	machine front
	Adatto 8	gears	130	no	180	drum 3 pockets	machine front
RASO 400	Adatto 1	gears/shafts	270	285+220	315	single hand	front/rear m.
	Adatto 3	gears/shafts	135	200+200	315	double hand	front/rear m.
	Adatto 5	gears/shafts	180	350+250	315	double hand	front/rear m.
	Adatto 5	gears/shafts	235/300	350+250	400/500	double hand	front/rear m.
	Ring	gears/shafts	130/230	300+200	315/365	20+20 pallets	traversing ring
RASO 600	Adatto 1	gears/shafts	600	350+250	400	single hand	rear m.
RASO 250 TP	Portal	gears/shafts	250	400	n.a.	double gripper	machine front



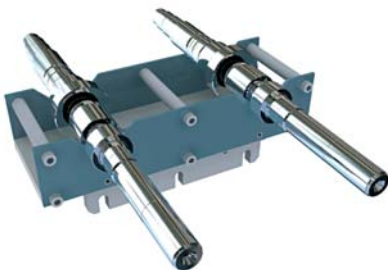
Loader adatto 6 with double hand



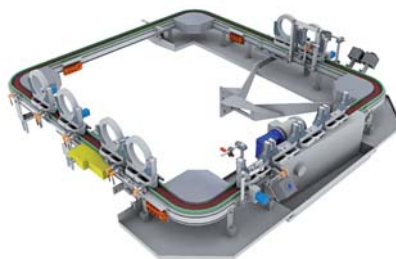
Loader adatto 8



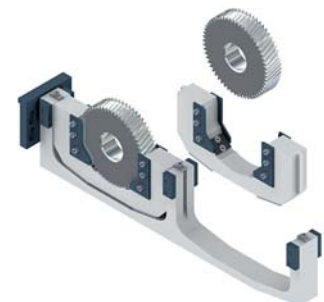
Special single hand for adatto 1 loader



Double hand for adatto atto 3 loader



Ring loader



Double hand for adatto 5 loader

Optionals turn-key solutions

Every step of the shaving process must be carefully studied to get as a result a Perfect Shaving. SICMAT has the know-how to study and supply “turn key” solutions for any specific need.

Optional units:

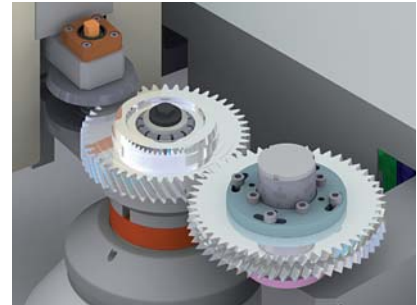
- + deburring/chamfering unit (integrated)
- + oil spin off unit
- + marking unit
- + filtration unit
- + headstock and tailstock controlled axes (A & B axes)
- + special cutter-holding nose for double cutter (combined cycle - RASO 400)

Tools:

- + shaving cutters
- + shaving cutters resharping service
- + deburring and chamfering tools

Workpiece clamping fixtures:

- + fixed type
- + hydraulic expandable type
- + mechanical expandable type
- + hydraulic steady rests, bushes for shafts



Deburring / chamfering



Deburring / chamfering

Shaving cutter resharping
service carried out by
Samputensili GS 400

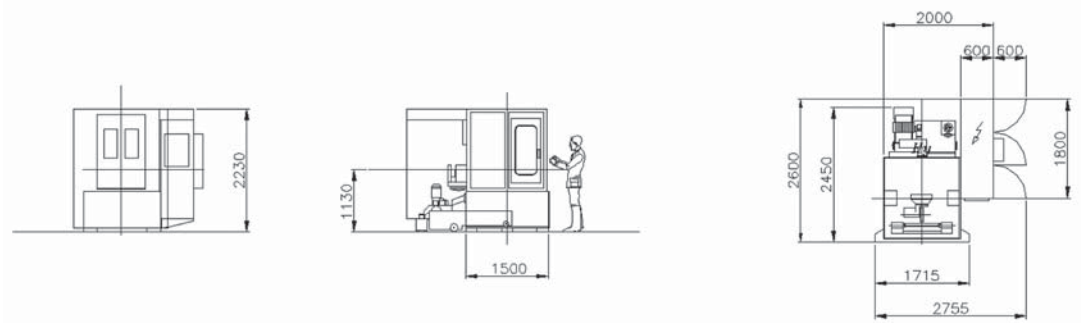


Technical data

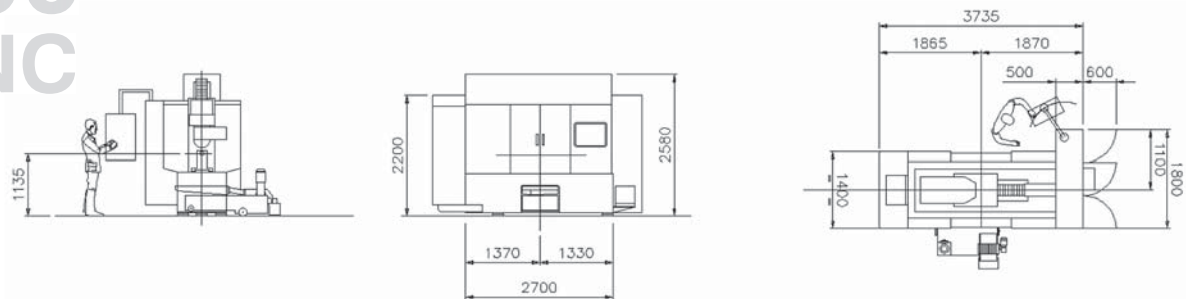
		200/3 Ax	200/5 (7)Ax	400/4 Ax	400/5 (7)Ax	600/5 (7)Ax	250 TP
Min./Max. Module	mm	0,8 ÷ 3,5	0,8 ÷ 4,5	1 ÷ 4	1 ÷ 8	1 ÷ 10	1 ÷ 8
Min./max. distance between shaving cutter & workpiece axes (Standard tailstocks height)	mm	110 ÷ 202	110 ÷ 202	119 ÷ 329	119 ÷ 329	227 ÷ 437	120 ÷ 345
Min./Max. diameter of shaving cutter	mm	178 ÷ 245	178 ÷ 245	178 ÷ 254	178 ÷ 254	178 ÷ 254	200 ÷ 254
Shaving cutter bore diameter	mm	63,5 (100)	63,5 (100)	63,5 (100)	63,5 (100)	63,5 (100)	63,5 (100)
Min./Max. shaving cutter width (standard)	mm	19 ÷ 50,8	19 ÷ 50,8	19 ÷ 50,8	19 ÷ 50,8	19 ÷ 50,8	19 ÷ 50,8
Maximum face to be shaved (standard)	mm	42	96	42	160	160	220
Table oscillation	degrees	± 1,7	± 1,7	± 1,7	± 1,7	± 1,7	
Min./Max. chamfering tool diameter	mm						120 ÷ 180
RADIAL AXIS							
Reading	mm	0,001	0,001	0,001	0,001	0,001	0,001
Rapid positioning speed	mm/min	250	250	375	375	375	27000
Working feed	mm/min	0,1 ÷ 4	0,1 ÷ 4	0,1 ÷ 4	0,1 ÷ 4	0,1 ÷ 4	0,1 ÷ 4
Stroke	mm	92	92	210	210	210	200
TAPER & CROWN AXIS							
Reading	degrees	0,001	0,001	0,001	0,001	0,001	0,001
Speed	deg/min	61	61	36	36	36	630
Stroke	degrees	± 1,7	± 1,7	± 1,7	± 1,7	± 1,7	± 2
LEAD AXIS							
Reading	mm	0,001	0,001	0,001	0,001	0,001	0,001
Speed	mm/min	720	720	500	500	500	2880
Stroke	mm	-25/+45	-25/+45	± 90	± 90	± 90	± 90
TRANSVERSE AXIS							
Reading	mm		0,001		0,001	0,001	0,001
Speed	mm/min		500		750	750	35000
Stroke	mm		± 8		± 15	± 15	± 100
PARALLEL AXIS							
Reading	mm		0,001	0,001	0,001	0,001	0,001
Speed	mm/min		500	1500	1500	1500	10000
Stroke	mm		± 30	± 60	± 60	± 60	240
HEADSTOCK AXIS							
Reading	mm		0,1		0,1	0,1	
Speed	mm/min		2000		2000	2000	
Stroke	mm		140		290	290	
TAILSTOCK AXIS							
Reading	mm		0,1		0,1	0,1	0,001
Speed	mm/min		2000		2000	2000	15000
Stroke	mm		140		600	600	390
SHAVING CUTTER SPINDLE							
Speed	rpm	400	400	400	400	400	500
WORKPIECE SPINDLE							
Speed	rpm						
Installed power (with pump and coolant filter)	KVA ca.	25	26 (27)	28	29 (30)	33 (34)	83
Net mass (electrical cabinet included)	Kg ca.	4000	4200	7800	8000	9000	12000
Power circuits	V	400	400	400	400	400	400
Standard execution	Hz	50	50	50	50	50	50
Auxiliary circuits (standard execution)	V	24 D.C.	24 D.C.	24 D.C.	24 D.C.	24 D.C.	24 D.C.

Layouts
RASO 200/400/600/250 TP

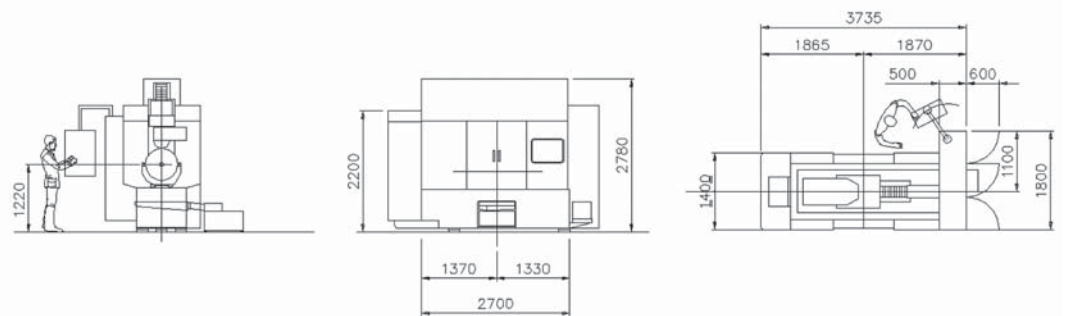
**200
CNC**



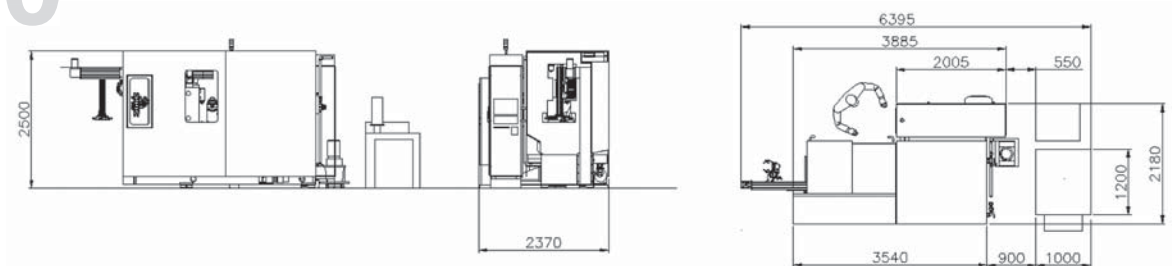
**400
CNC**



**600
CNC**



**250
TP**





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