



THINK PARTS THINK TORNOS



SIGMA 20 / SIGMA 32

Sliding headstock single spindle automatic lathe

SIGMA 20 / SIGMA 32

A KINEMATIC GEARED TOWARD MULTI TASKING AND PERFORMANCE!



Multi tasking

- All the tool holders and accessories can be mounted on either tool slides.
- Large array of heavy duty tool holders, allow for the machining of value added operations.
- Up to 28 tool positions.

Performance

- Great capacity for chip removal.
- Thanks to a roughing tool, it is possible to have up to 3 tools in the cut simultaneously.



When the SIGMA 20 / 32 is coupled with the Tornos bar loader SBF 532 it forms a high performing and complete manufacturing cell from a single source supplier.

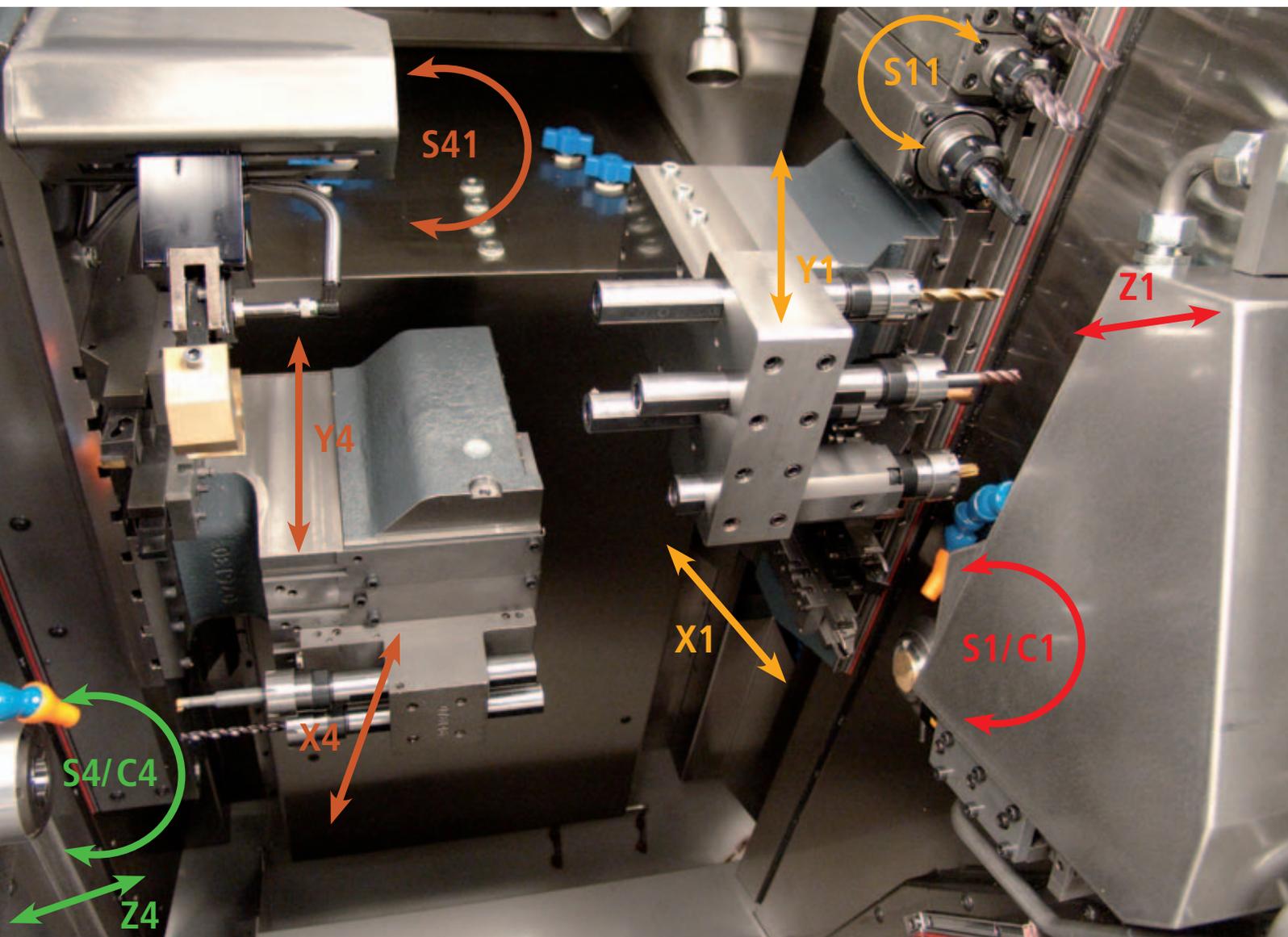
Rigidity

- SIGMA 20 / 32 is the only lathe on the market that offers an identical rigidity in main and counter operations.
- Identical headstock and counter spindle offer high power (6.0 / 7.5KW).

Simplicity

- Programming choice, ISO or TB-DECO (option).
- Very simple ISO programming, thanks to the 2 channels concept which are completely independent.
- Excellent ergonomics permitting to easily change and set the tools (option).
- Tool presetting system.

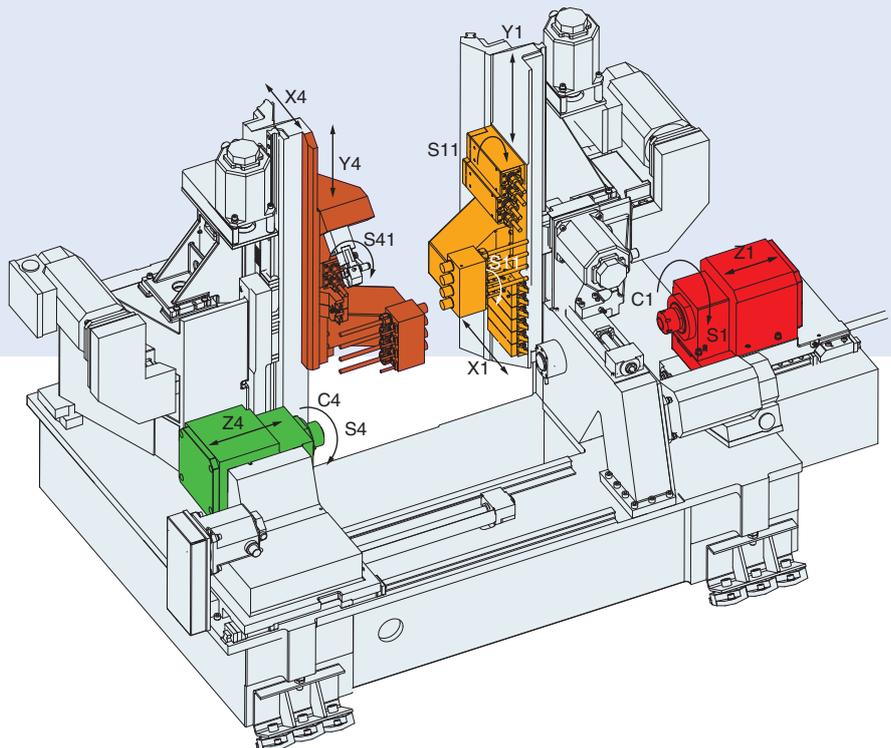
SIGMA 20 / SIGMA 32 KINEMATICS GEARED TOWARDS TASKING AND PERFORMANCE



- Kinematics with two completely independent tool systems.
- Open machining area provides optimum chip removal.
- Very easy access to tooling.
- Fully independent counter-spindle.
- Mirror-like kinematics providing complete flexibility for front and back operations.
- Tool settings all done numerically.
- Independent coolant line on each tool.

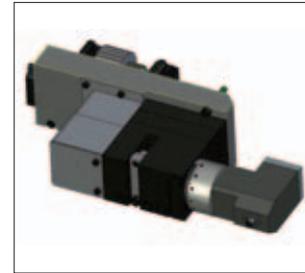
SIGMA 20 / SIGMA 32 LATHE WITH 6 LINEAR AXES

| | | |
|-----------------------------|-----------------------------------|-----------------------------------------|
| Z1 | C1 | S1 |
| Sliding headstock | Axis C sliding headstock (option) | Main spindle |
| X1 / Y1 | | S11 |
| Platten 1 (main operations) | | Motorisation of tools – main operations |
| X4 / Y4 | | S41 |
| Platten 2 (back operations) | | Motorisation of tools – back operations |
| Z4 | C4 | S4 |
| Counter-spindle | Axis C counter spindle (option) | Counter spindle |



SIGMA 20 / SIGMA 32

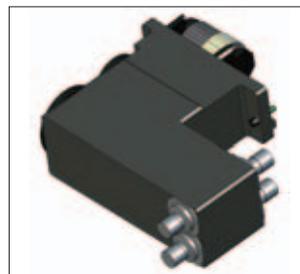
MULTI TASKING: THE GUARANTEE OF HIGH FLEXIBILITY!



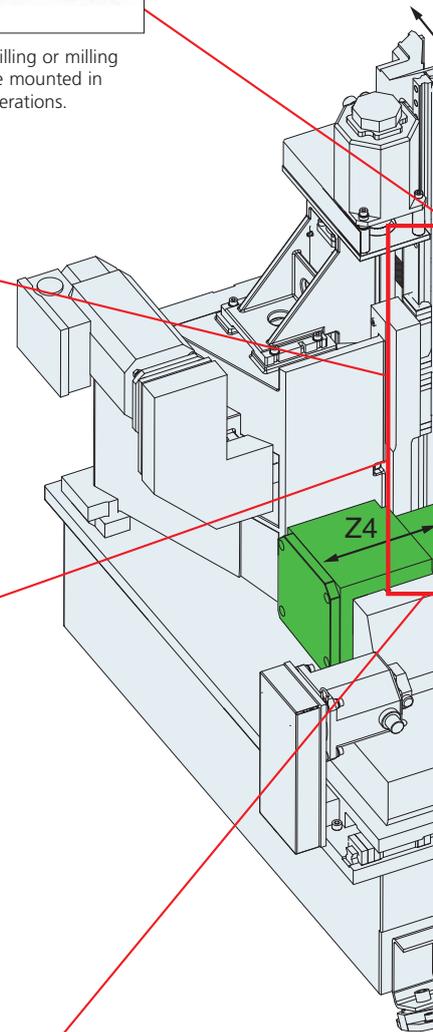
Adjustable angle drilling or milling attachment. Can be mounted in main or counter operations.



Thread whirling attachment. Can be mounted in main or counter operations.



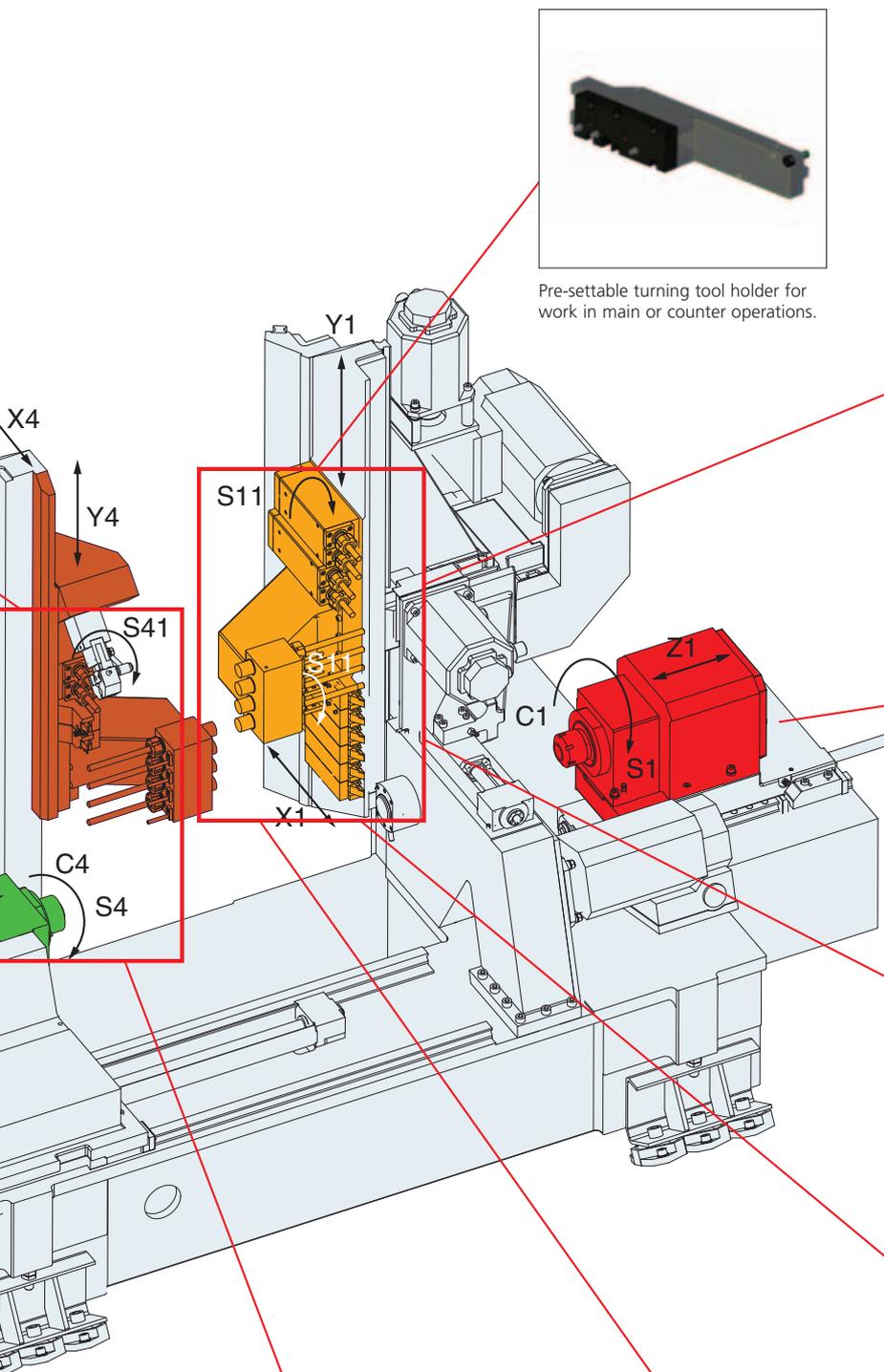
Double ended 2 spindles rotating attachment with spindles for ESX-16 collet.



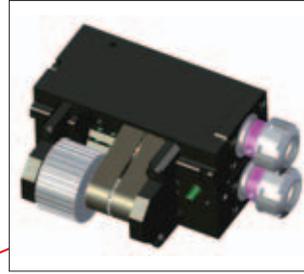
- The tool holder system combines accuracy with flexibility and interchangeability.
- Attachments for operations such as polygon turning and thread whirling are easily integrated on the main spindle.
- A total of 28 tool positions allowing multiple operations. According to how the machine is configured we can mount up to 12 rotating tools.
- All tool holders are designed with a quick change system.



Radial polygon attachment.



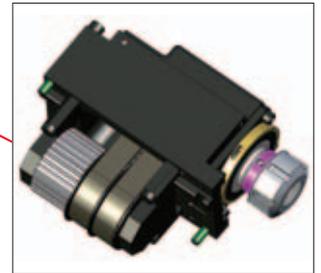
Pre-settable turning tool holder for work in main or counter operations.



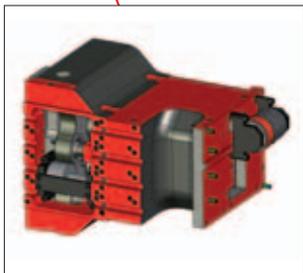
Double rotating drilling or milling attachment, with spindles for ESX-20.



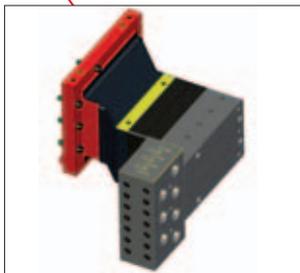
Double cone collet for headstock.



Rotating milling or drilling attachment, with spindle for ESX-25.



Motorized end working tool block for up to 4 rotating or steady tools.



End working tool block with 7 positions, Ø 20 mm bores, for steady tools.



Roughing tool, activated by M codes. (SIGMA 32 only).

SIGMA 20 / SIGMA 32

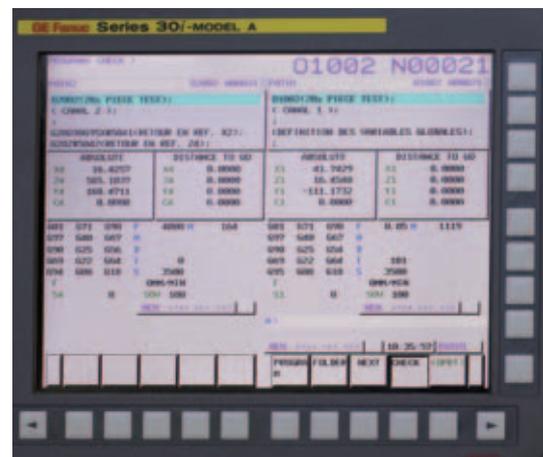
SIMPLICITY: THE GUARANTEE OF USER-FRIENDLY OPERATION!



The new Tornos innovations coupled with tried and tested solutions will very quickly enable the operator to successfully use the Sigma 20 & Sigma 32.

- Rapid tool changing systems.
- Entirely numeric tool setting and adjustment (all tools are fitted on 3 axes with no mechanical adjustments).
- Very easy programming in ISO language thanks to the kinematic concept that uses two completely independent tool systems.

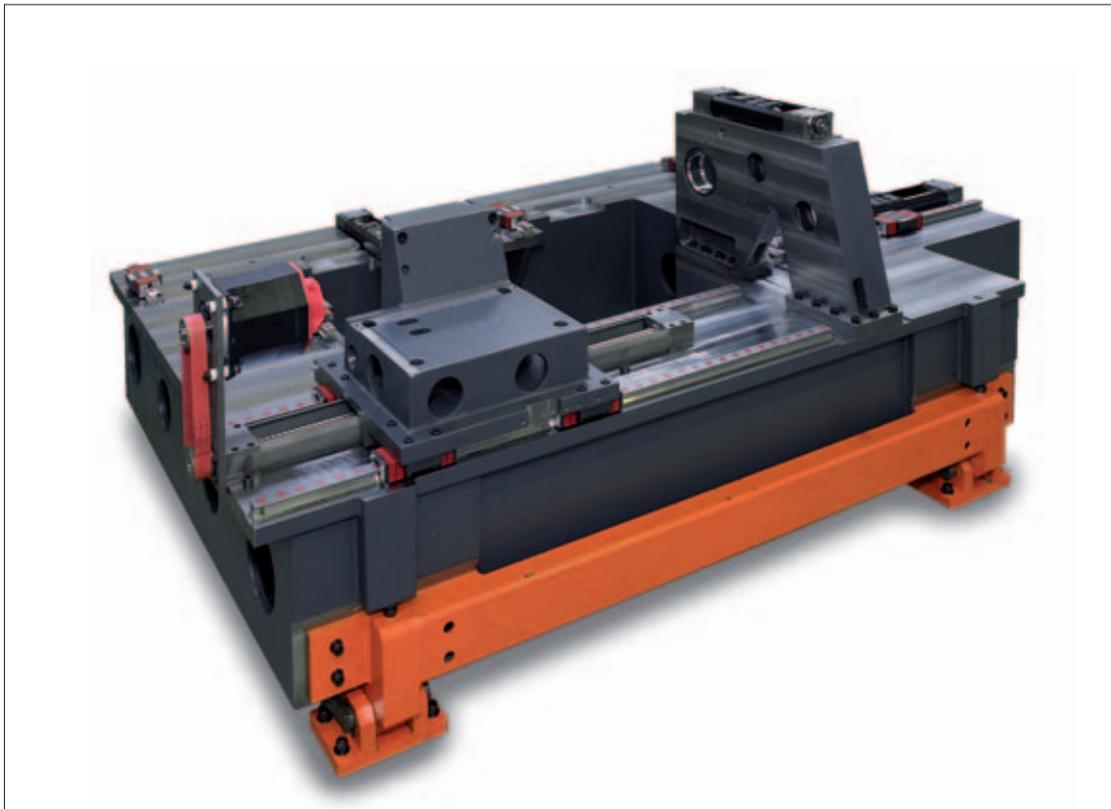
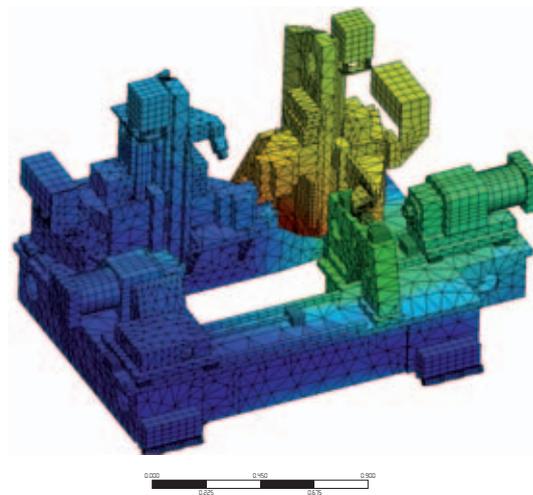
- TORNOS macro assistant simplifies cutting, bar feeding and bar end operations.
- ISO programming and TB-DECO as an option.
- Manual Pulse Generator (setting of the tools + scrolling of part program).



SIGMA 20 / SIGMA 32

RIGIDITY: THE GUARANTEE OF QUALITY MACHINING

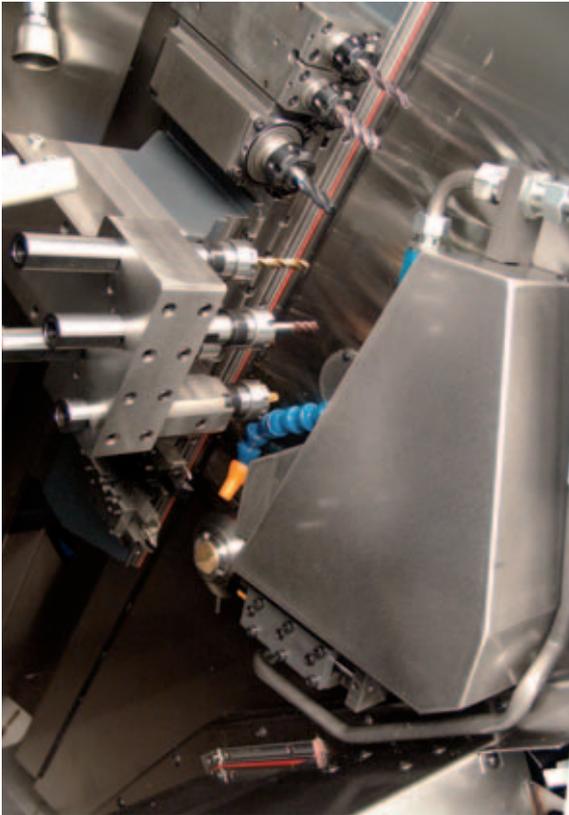
- In counter operations with as much as 3x the rigidity than its competitors the SIGMA 20 / SIGMA 32 allows for a profitability as much as 30% higher for parts where the machining operations are well balanced between main and counter operations.
- Identical rigidity and identical spindles in main and counter operations.
- The tool wear and the machining quality are directly linked to the machine rigidity. On the SIGMA 20 / 32, it is no longer necessary to favor the machining operations to the work done in main operations so to optimize the quality and machining autonomy of the machine.
- The headstock and counter spindle are on the same plane.
- A cushioning system absorbs important accelerations.



SIGMA 20 / SIGMA 32

PERFORMANCE:

THE GUARANTEE OF OPTIMUM PRODUCTIVITY



- In main operations the power of the SIGMA 32 headstock (6.0/7.5 KW) coupled with the roughing tool allow for high depths of cut, resulting in the removal of large amount of chips.
- The spindles offer a high clamping force. If needed it is also possible to mount a double cone collet on the headstock as well as a large opening (for over clamping) collet in counter operations.
- SIGMA 20 and SIGMA 32 have identical power and rigidity in main and counter operations.
- All machining operations, such as turning, radial drilling and milling and axial drilling can be executed as back-operations.
- Fully independent counter operations.



AC. Inox 303
Ø 15 mm



42 CR MO S4
Ø 22 mm



Inox 303
Ø 20 mm



Inox 316L
Ø 26 mm



ETG 88
Ø 15 mm



S35PbK
Ø 21 mm

SIGMA 20 / SIGMA 32

TECHNICAL SPECIFICATIONS

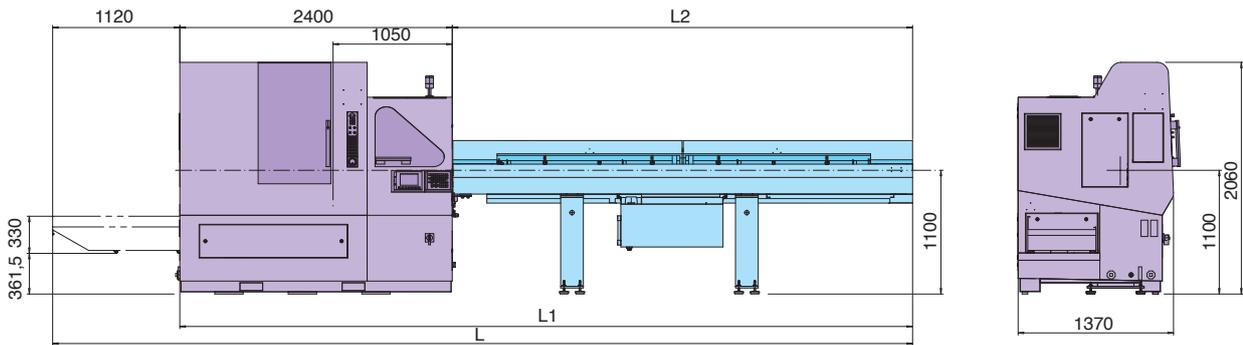
| MAIN OPERATIONS | | SIGMA 20 | SIGMA 32 |
|-------------------------------------|-----------|-----------------------------|-----------------------------|
| Z1 axis travel (sliding headstock) | mm / Inch | 230 / 9.06 | 230 / 9.06 |
| Bar capacity | mm / Inch | 20 (25.4) / 1 | 32 / 1.26 |
| Main spindle speed max. | rpm. | 10'000 | 0-8'000 |
| Main spindle power | kW | 3.7 / 5.5 | 6.0 / 7.5 |
| Clamping collets | | F20; F25; F30 | F25; F30; F37 |
| Guide bush | | Fixed; turning; Habegger | Fixed; turning; Habegger |
| Number of tools for main operations | | 14 | 14 |
| Speed of S11 rotating tools | rpm. | 10'000 | 10'000 |
| Rotating tool section | mm / Inch | 16 x 16 / 0.63 x 0.63 | 16 x 16 / 0.63 x 0.63 |
| Number of radial rotating tools | | 4 max. | 4 max. |
| Number of axial rotating tools | | 4 max. | 4 max. |

| COUNTER OPERATIONS | | | |
|----------------------------------------|-----------|-----------------------|-----------------------|
| Clamping range of the counter spindle | mm / Inch | 20 (25.4) / 1 | 32 / 1.26 |
| Counter spindle speed max. | rpm | 10'000 | 0-8'000 |
| Counter spindle power | kW | 3.7 / 5.5 | 6.0 / 7.5 |
| Clamping collets | | F20; F25; F30 | F25; F30; F37 |
| Number of tools for counter operations | | 8 | 8 |
| Speed of S41 rotating tools (optional) | rpm. | 10'000 | 10'000 |
| Rotating tool section | mm / Inch | 16 x 16 / 0.63 x 0.63 | 16 x 16 / 0.63 x 0.63 |
| Number of radial rotating tools | | 4 max. | 4 max. |
| Number of axial rotating tools | | 4 max. | 4 max. |

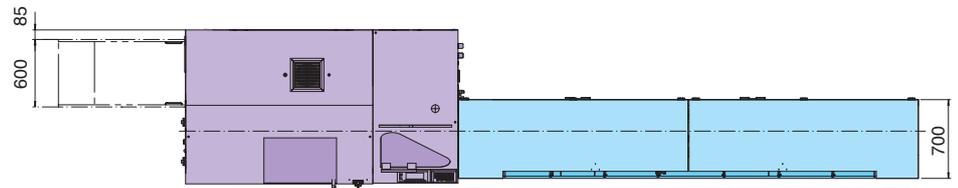
| GENERAL SPECIFICATIONS | | | |
|--------------------------------------|------------|---------------------------------------------|---------------------------------------------|
| Number of linear axes | | 6 | 6 |
| Rapid traverse rate | m/min. | 30 | 30 |
| Weight | kg | 3'000 | 3'000 |
| Dimensions (length x width x height) | mm Inch | 2'400 x 1'380 x 2'050 94.5 x 54.5 x 80.8 | 2'400 x 1'380 x 2'050 94.5 x 54.5 x 80.8 |
| Installed power | KVA | 14 | 14 |

SIGMA 20 / SIGMA 32

TECHNICAL SPECIFICATIONS



| Max bars length (mm) | L | L1 | L2 |
|----------------------|------|------|------|
| 3200 | 7575 | 6455 | 4055 |
| 4200 | 8575 | 7455 | 5055 |
| length (Inch) | | | |
| 12 ft | 324 | 280 | 185 |



NUMERICAL CONTROL

FANUC 31i numerical control

10.4» colour screen

Manual Pulse Generator (setting of the tools + scrolling of part program)

Ethernet interface, RS232, Flash memory card

ISO programming

64 KBytes program memory

32 tool geometries and 32 tool correctors

Tool radius compensation

Loading and editing of part program as a background task

Display of work hours and part counter

Display of the component cycle time or a specific operation

Standard basic cycles: initialization, new part, new bar

Tool adjustment cycle

Standard tool threading cycle

Rigid tapping function

G96 constant surface speed function

S1 indexing by increments of 0.001 degree on the main spindle

Simple stop function on counter spindle

NUMERIC CONTROL MEMORY AND SOFTWARE OPTIONS

C1 axis operation on main spindle

S4 indexing by increments of 0.001 degree on the counter spindle

Function of axis C4 on counter-spindle

Up to 8 MBytes of memory for part programs

64 tool geometries and 64 tool correctors

Inch/metric

Chamfer or radius at stop + angle programming

Interpolation in polar co-ordinates (Transmit function)

Helicoidal interpolation (X, Y, and Z with G2 or G3)

Cylindrical interpolation

Polygon function with two spindles

Graphical view of the tool's trajectory

Factory operations: drilling/stripping

Customer B macro

Management of Tool Service Life

Linear increment of the tool wear in X

Numeric control interface for automatic correction of dimensions by RS232

Automatic machine warm-up cycle

Ethernet interface for production control (OEE)

TB-DECO programming

STANDARD ACCESSORIES

Part catcher

Removable chip tray

Oil tank

Coolant pump

Work light

Electrical interface for bar loader

Electrical interface for fire prevention system

OPTIONAL ACCESSORIES

Additional coolant pump for cooling via the inside of tool holders (Sigma 20)

Swarf conveyor

Tool breakage detector

Part conveyor belt

Device for long parts

Mist collector

20 and 120 bar high-pressure device

Device for regulating cutting oil temperature

Fire prevention system

Tool presetter

Automatic bar loader

COMPLIES WITH CE AND CEM STANDARDS

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