

**RatioLine**  
**G 250**  
**G 400**

High-performance  
turn-mill centers



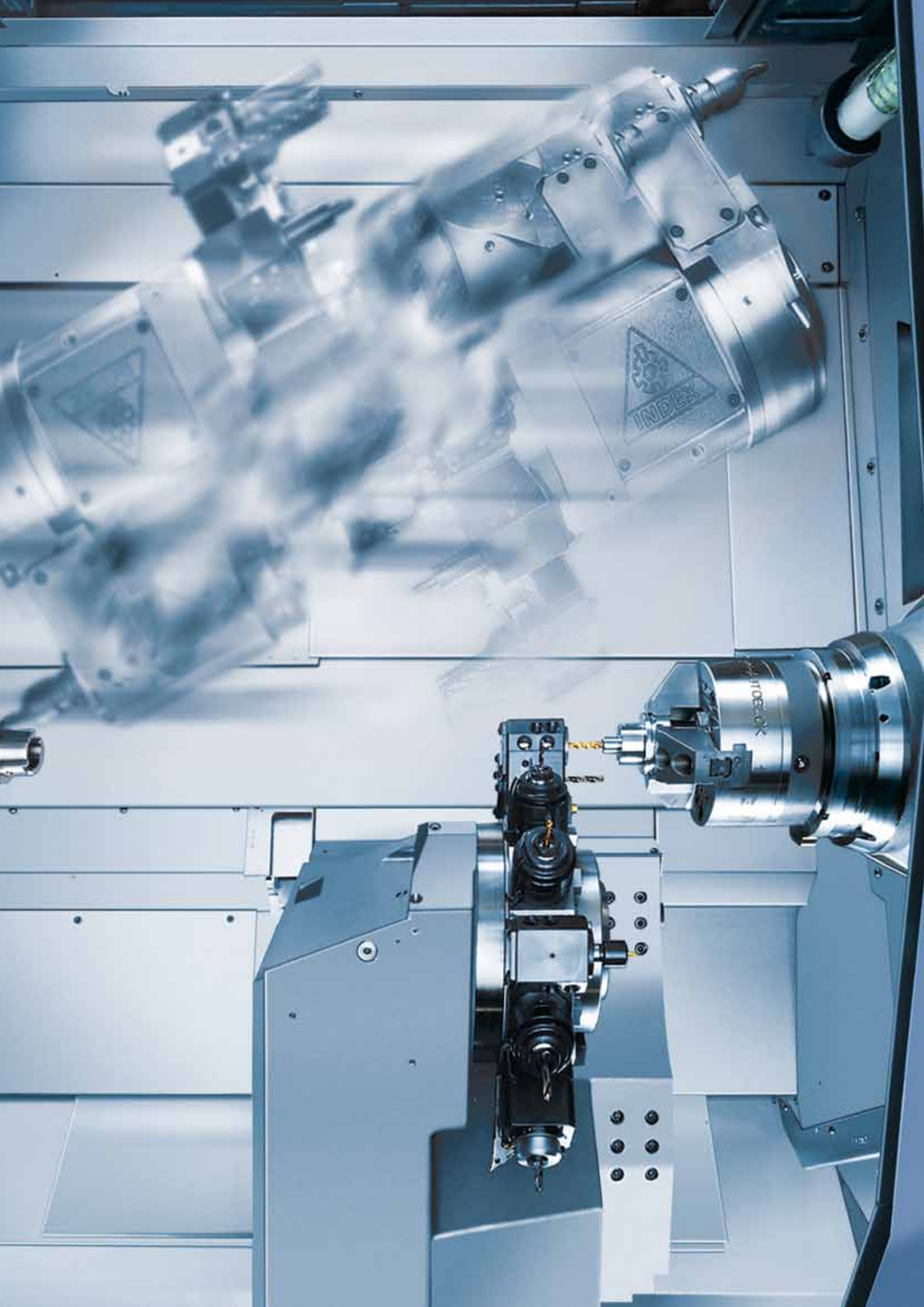
## Performance, precision and flexibility in every dimension

### Innovative machine concept

The INDEX RatioLine G series is based on an innovative machine concept: A practice-oriented modular system design allows you to assemble without compromise almost any machine configuration that you may require for economic and future-oriented production. Whether you need a highly productive or a highly flexible turn-mill center for small or large lot sizes:

You can assemble exactly the machine that is optimally tailored to your present and future requirements. In any case, we will advise you individually on the right configuration of your machine. This customized machine will make your production more economical.



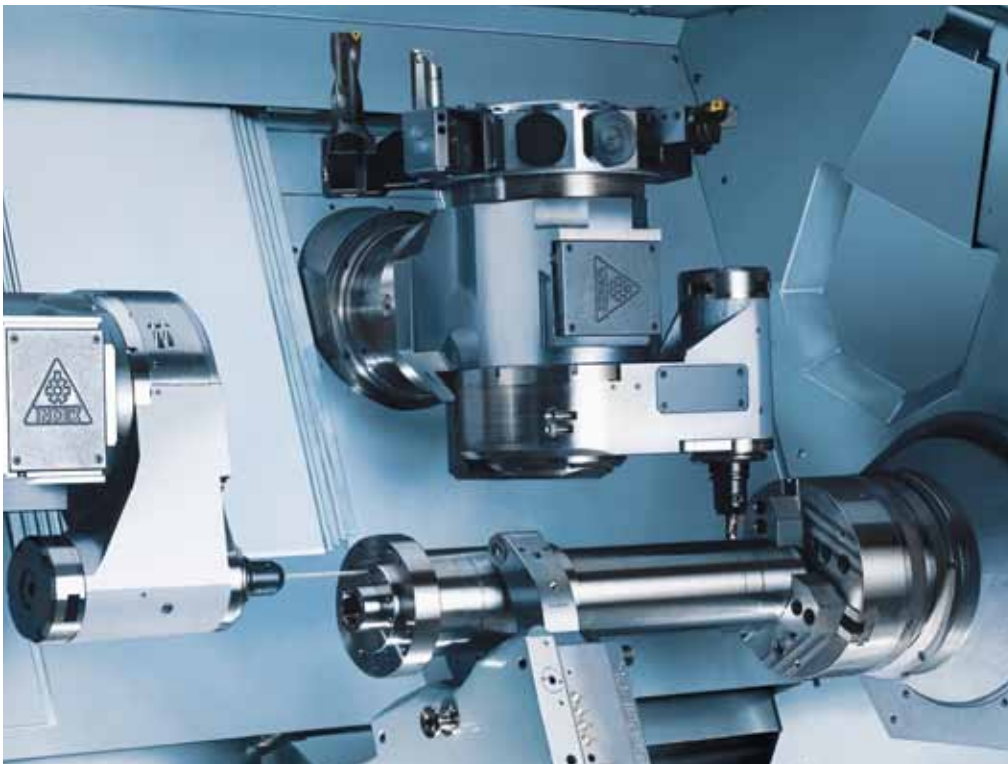


## High productivity for your machining tasks



**Machining center,  
including a milling center:  
G250**

- 2 work spindles, max. bar diameter 102 mm
- 1 motor milling spindle also for fixed tools; up to 80 magazine stations
- Y/B axis
- 12-tool turret (all driven)

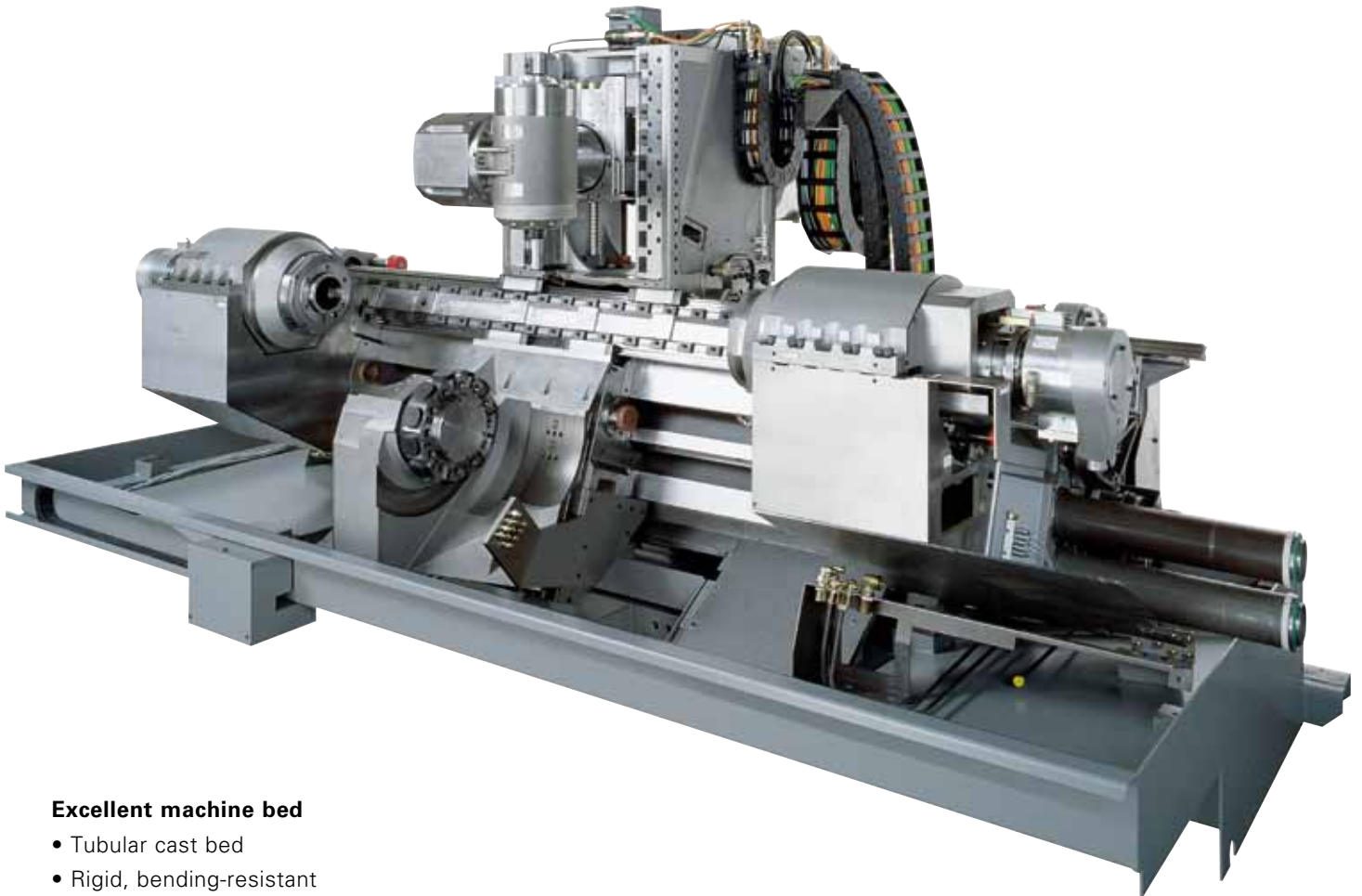


**Highly flexible: G400**

- 2 work spindles, max. bar diameter 102 mm
- 2 turrets
- 24 tool stations (all live)
- Turret with Y/B axis and two multifunctional units for live and fixed tools; 64 magazine stations
- 1 programmable steady rest



## Impressive machine construction, precisely tuned



### Excellent machine bed

- Tubular cast bed
- Rigid, bending-resistant
- Vibration-absorbing

### Strong guides

- Large-dimensioned linear slideways
- Wide tracks for enormous metal-cutting performance

### Precise position gauging systems

- Direct position gauging systems in all X axes for high-precision machining

### Motor spindle

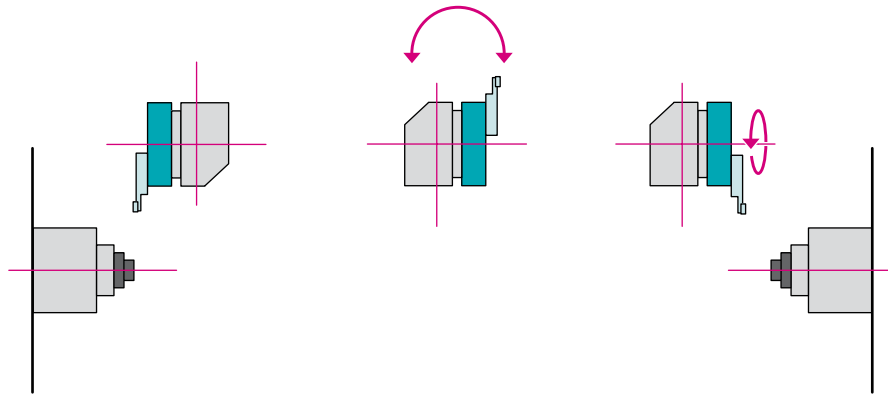
- Patented air cooling for the main and counter spindles of identical design. They are cooled precisely where the heat is generated: directly at the rotor
- Powerful: high torque and high dynamics

# Innovations that pay off

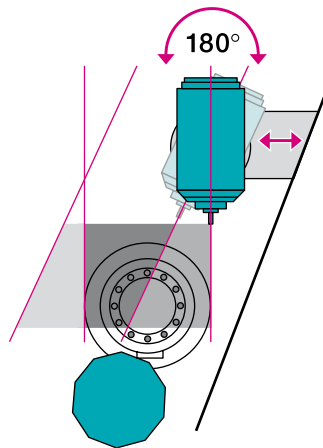
## Y/B axis with genuine 360°

- 360° swiveling range (optional)
- Machining at any desired angle
- Full use of turrets at the main and counter spindles
- 5-axis machining for demanding contours
- Quill design with hydrostatic, zero-backlash and no-wear bearing for high precision and optimum rigidity

**Maximum utilization of the tool stock: The same tool can be used at the main and counter spindles, thus reducing the no. of tools required.**



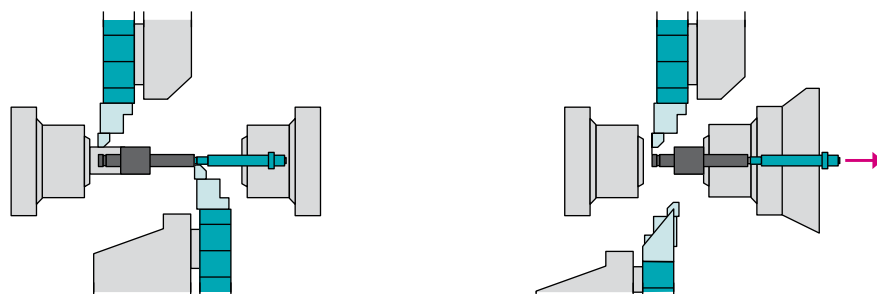
**Highly flexible utilization of the working area in the Y direction by means of the A axis with max. stability and extremely short lever action of the Y axis.**



## The work spindle with center support (optional)

- The thrust can be programmed to vary continuously

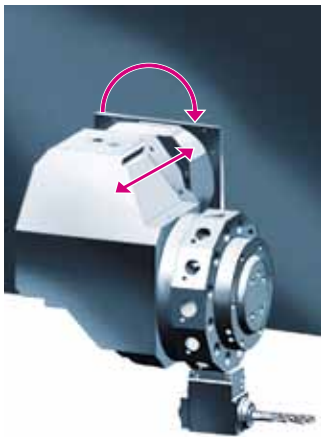
**Using the counter spindle as tailstock and an integrated live center support makes it possible to support the workpieces. When the counter spindle picks up the workpiece, the center support is simply pushed back into the counter spindle.**



## Reducing the setup time - that's the right approach

### Tool corrections via the Y and B axes

Tolerances of the tool position can be compensated with savings in time and with  $\mu$  precision via the control in the Y and B axes.



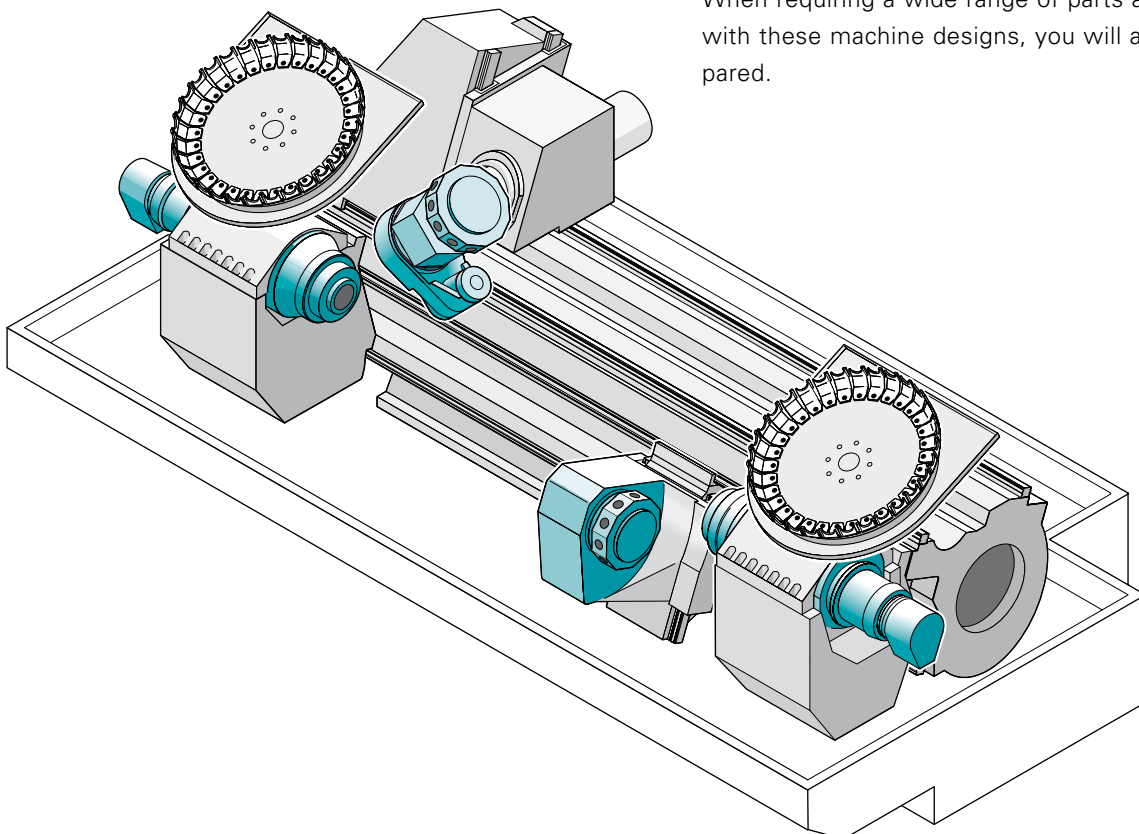
### Patented W serration for high repetitive accuracy in tool changing

The patented W serration makes it possible to achieve a repetitive accuracy of a few  $\mu$  in tool holder changing.



### Machine setup: up to a max. 150 tool pockets

When requiring a wide range of parts and small lot sizes, with these machine designs, you will always be fully prepared.





# Integrated handling system: fully automatic

In production with minimum operator intervention, the optionally integrated WHU/WHW handling system does the automatic loading and unloading of chuck parts and shaft parts.

## For chuck parts

- Max. workpiece diameter
- Max. workpiece length
- Max. workpiece weight

## G250

- 200 mm
- 200 mm
- 2 x 10 kg

## For shaft parts

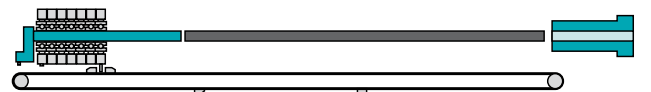
- Max. workpiece diameter
- Max. workpiece length
- Max. workpiece weight

- 80 mm
- 700 mm
- 2 x 15 kg

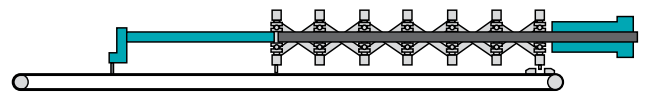


## INDEX MBL bar loading magazine

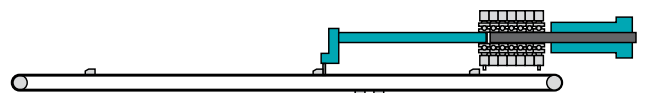
- Max. bar diameter 65 mm
- Max. bar length 4000 mm



Loading position



Feeding position



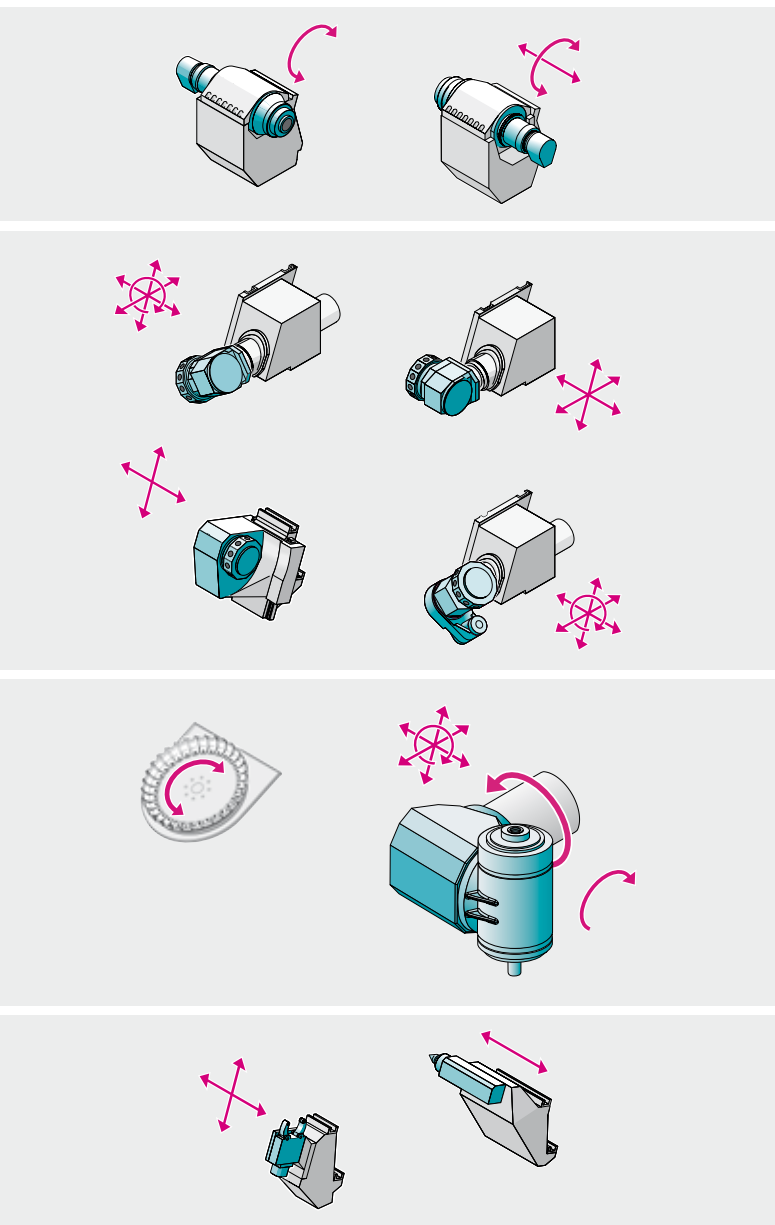
Bar end before



End position

# Three machine examples

## Components to choose



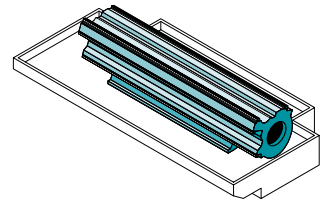
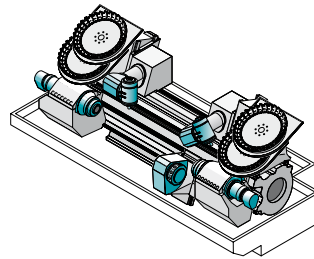
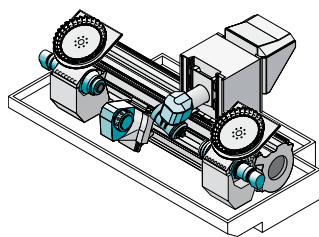
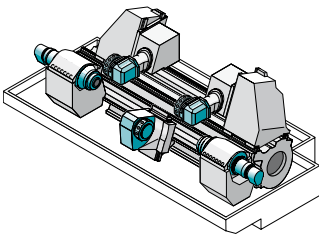
| <b>Work spindle 1+2</b>       |              | <b>G250</b>        | <b>G400</b>        |
|-------------------------------|--------------|--------------------|--------------------|
| max. bar capacity             | mm           | 102                | 102                |
| max. chuck size               | mm           | 315                | 500                |
| <b>Work area</b>              |              |                    |                    |
| max. turning length           | mm           | 800/<br>1400       | 1250 /<br>2000     |
| <b>Turret</b>                 |              | <b>1-3</b>         | <b>1-3</b>         |
| Number of stations per turret |              | 12                 | 12 (10)            |
| Tool drive                    | rpm          | 6000               | 6000               |
| <b>Multi functional unit</b>  |              | <b>1-2</b>         | <b>1-2</b>         |
| Tool system                   | HSK<br>Capto | A-50               | A-63/B-80<br>C6    |
| max. speed                    | rpm          | 6000               | 6000               |
| max. power                    | kW           | 11 / 15.7          | 17                 |
| Tool magazines                |              | 1-4                | 1-2                |
| Tooling capacity              |              | 32                 | 32                 |
| <b>Motor milling spindle</b>  |              | <b>1</b>           | <b>1-2</b>         |
| Tool system                   | HSK<br>Capto | A-63<br>C6         | A-63<br>C6         |
| max. speed                    | rpm          | 18000              | 18000              |
| max. power                    | kW           | 27.5               | 27.5               |
| max. torque                   | Nm           | 115                | 115                |
| Tool magazine                 |              |                    |                    |
| x stations max.               | HSK<br>Capto | 4 x 20 /<br>2 x 20 | 4 x 20 /<br>2 x 20 |
| <b>Tailstock</b>              |              |                    |                    |
| Thrust                        | N            | 15000              | 15000              |
| Mounting                      | SK           | 30                 | 30 (40)            |
| <b>Steady rest</b>            |              | <b>1</b>           | <b>1-2</b>         |

# Configure your made-to-order machine

Example 1: G250

Example 2: G250

Example 3: G400



|     |     |     |  |
|-----|-----|-----|--|
| 1+2 | 1+2 | 1+2 |  |
| 90  | 102 | 102 |  |
| 315 | 315 | 500 |  |
|     |     |     |  |
| 3   | 1   | 1   |  |
|     |     |     |  |
|     |     |     |  |
|     |     |     |  |
|     |     |     |  |
|     | 1   | 2   |  |
|     |     |     |  |
|     |     |     |  |
|     | 2   | 4   |  |
|     |     |     |  |
|     |     |     |  |

Examples 1 to 3 show common and interesting solutions. We will be glad to advise you individually on the configuration of your machine.

# Control

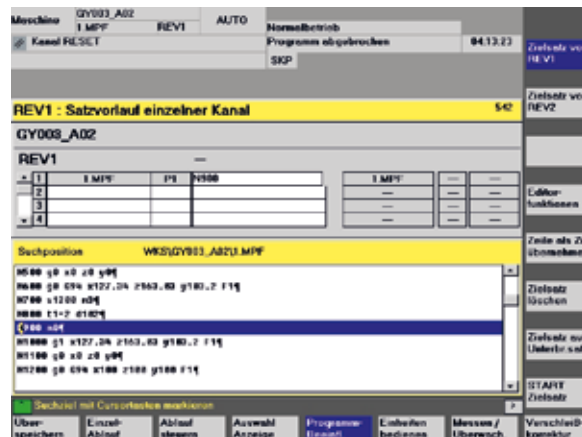
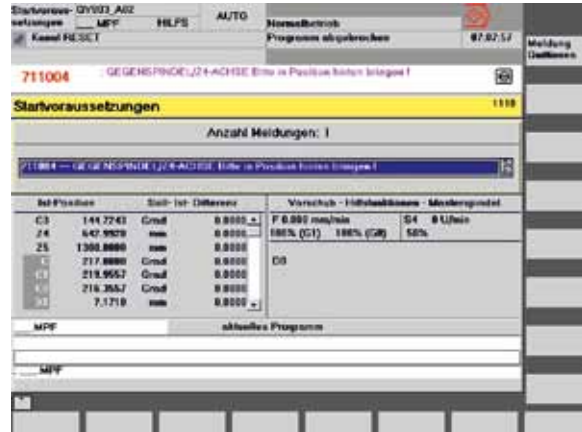
Saving time and lowering costs: The INDEX C200-4D control concept based on Siemens 840D powerline provides you with powerful and highly advanced control technology for every practical application. Productive power according to program.

## Competent operator guidance

- Plain text dialog in display and use
- All spindles and axes at a glance
- Identical interface in all machines of the series
- In case of errors: place and cause of error are reported
- „Online“ error and service documentation

## Expert programming

- Far more than 70 user cycles
- Offer practice-oriented support down to the smallest detail
  - Guarantee a secure program run with maximum flexibility
  - Ensure optimum running and efficient use of the machine



## INDEX C200-4D



based on Siemens 840D

### Quick setup ...

- Including axis lock
- Approach of tool carriers "step by step"
  - Check of superimposed machining processes at standstill

Including T word acknowledgement mode

- User control prior to each turret indexing

All of that is done without any modification in the programs

### Starts immediately ...

- Via block search
- Key press resumes process at the point of interruption
  - Channel-synchronous advance to any desired program point
  - REPOS-guided safely to the (new) starting point
  - Start requirements: the correct machine state can be established simply and without collision

### Operational safety ...

Absolute encoder systems know position in any situation

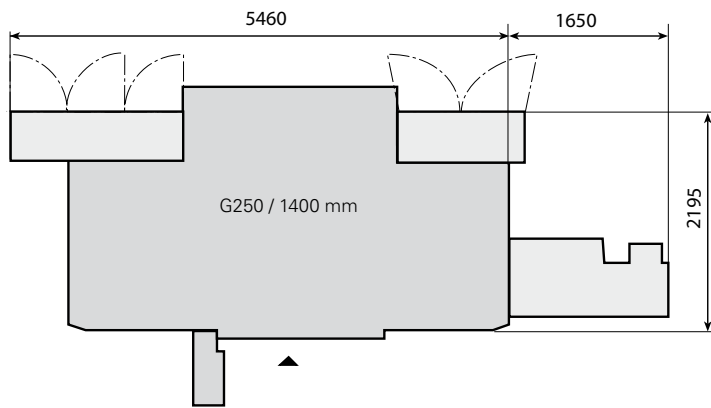
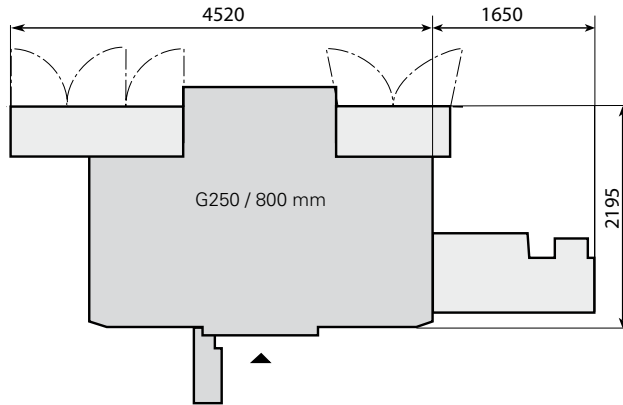
### Safety Integrated ...

- Maintains axis positions and clamping positions even with the protective hood open
- Checks whether safety device function is working correctly with respect to the cycle
- Personal protection quick to react

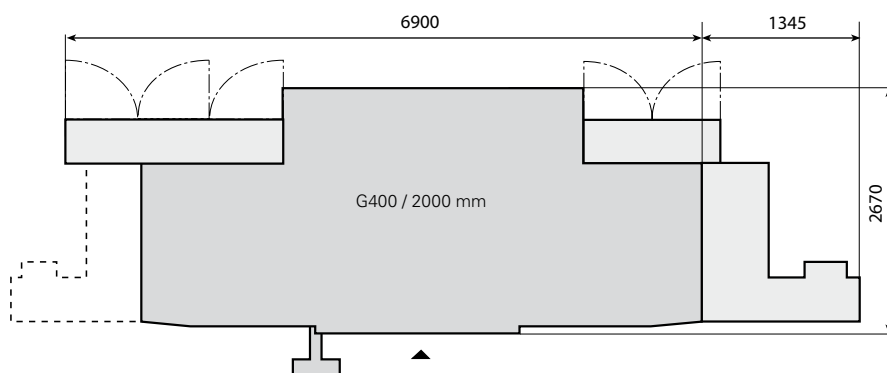
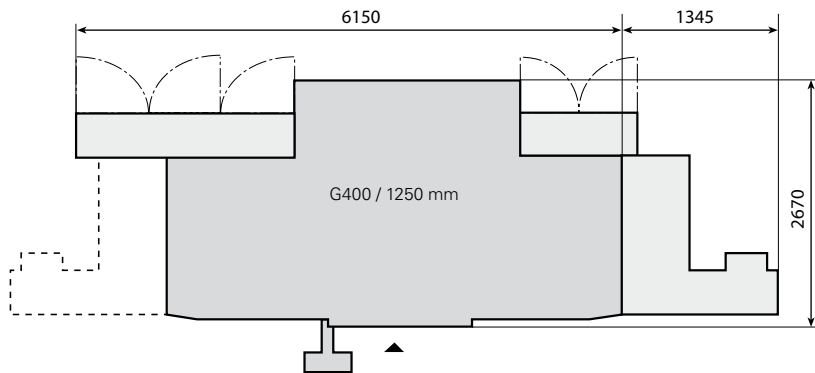
### and flexibility!

- Tool breakage monitoring system upon request
- Tool control system and replacement tools possible
- ETHERNET network connection to DNC possible
- Machine data acquisition (MDA / ODA possible)
- Teleservice possible

**RatioLine G 250**



**RatioLine G 400**



# Technical data G250

## Work area

|                |    |            |  |  |  |
|----------------|----|------------|--|--|--|
| Turning length | mm | 800 / 1400 |  |  |  |
| Swing diameter | mm | 560        |  |  |  |

|                                  |         | D65       | D90       | D102      |  |
|----------------------------------|---------|-----------|-----------|-----------|--|
| Bar capacity (max. bar diameter) | mm      | 65        | 90        | 102       |  |
| Spindle diameter front bearing   | mm      | 110       | 140       | 140       |  |
| Spindle head ISO 702/1           | Size    | 6         | 8         | 8         |  |
| Chuck diameter                   | mm      | 200 / 250 | 250 (315) | 250 (315) |  |
| Speed                            | rpm     | 5000      | 3500      | 3500      |  |
| Power at 100% / 40%              | kW      | 43 / 57   | 43 / 57   | 44 / 60   |  |
| Torque at 100% / 40%             | Nm      | 275 / 363 | 275 / 363 | 400 / 610 |  |
| Alignment and indexing unit      | degrees | 2.5       | 2.5       | 2.5       |  |
| C axis resolution                | degrees | 0.001     | 0.001     | 0.001     |  |

|                       |       | X    | Z          | Y   | B               |
|-----------------------|-------|------|------------|-----|-----------------|
| Z axis rapid traverse | m/min | 30   | 30         | 30  |                 |
| Slide travel          | mm    | 300  | 800 / 1400 | 190 | 360 (degrees)   |
| Rapid traverse        | m/min | 22.5 | 45         | 10  | 360 (degr./sec) |

## Turret 1 and 3

|                                      |     |                              |  |  |  |
|--------------------------------------|-----|------------------------------|--|--|--|
| Number of stations                   | 12  |                              |  |  |  |
| Cylindrical shaft mounting DIN 69880 | mm  | 30 x 55 / 40 x 63 / Capto C4 |  |  |  |
| Tool drive speed                     | rpm | 6000                         |  |  |  |
| Tool drive power at 25%              | kW  | 11 / 17 (optional)           |  |  |  |
| Tool drive torque at 25%             | Nm  | 21.5 / 36 (optional)         |  |  |  |

## Multi functional unit 1 and 3

|                       |                     |             |  |                 |  |
|-----------------------|---------------------|-------------|--|-----------------|--|
| Tool system DIN 69893 | HSK-A50             |             |  |                 |  |
| Speed                 | rpm                 | 6000 / 1500 |  | 6000 / 1500     |  |
| Power at 25%          | kW                  | 11          |  | 15.7 (optional) |  |
| Torque at 25%         | Nm                  | 21.5 / 88   |  | 25 / 100        |  |
| Tool magazine         | max. 4 x 32 HSK-A50 |             |  |                 |  |

|                       |   | X                        | Z    | Y   | B               |
|-----------------------|---|--------------------------|------|-----|-----------------|
| Slide travel          | mm  | 300                      | 1840 | 286 | 360 (degrees)   |
| Rapid traverse        | m/min                                       | 22.5                     | 45   | 47  | 360 (degr./sec) |
| Tool system DIN 69893 | HSK-A63 / Capto C6                          |                          |      |     |                 |
| Speed                 | rpm   | 12000 / 18000 (optional) |      |     |                 |
| Power at 100% / 25%   | kW  | 27.5 / 27.5              |      |     |                 |
| Torque at 100% / 25%  | Nm  | 75 / 115                 |      |     |                 |
| Tool magazine         | max. 4 x 20 HSK-A63<br>max. 2 x 20 Capto C6 |                          |      |     |                 |

|                |       | X    | Z          |
|----------------|-------|------|------------|
| Slide travel   | mm    | 140  | 775 / 1375 |
| Rapid traverse | m/min | 22.5 | 45         |

## Turret 2

|                                      |     |                              |  |  |
|--------------------------------------|-----|------------------------------|--|--|
| Number of stations                   | 12  |                              |  |  |
| Cylindrical shaft mounting DIN 69880 | mm  | 30 x 55 / 40 x 63 / Capto C4 |  |  |
| Tool drive speed                     | rpm | 6000                         |  |  |
| Tool drive power at 25%              | kW  | 9.4                          |  |  |
| Tool drive torque at 25%             | Nm  | 19                           |  |  |

## Tailstock

|                          |       |            |
|--------------------------|-------|------------|
| Thrust                   | N     | 15000      |
| Taper DIN 2079           | SK 30 |            |
| Distance between centers | mm    | 830 / 1430 |

## Steady rest

|                |    |          |          |   |
|----------------|----|----------|----------|---|
| Clamping range | mm | 12 - 152 | 20 - 165 | 50 - 200 (optional other clamping ranges) |
|----------------|----|----------|----------|---|

## Dimensions, weight and connected power with maximum configuration

|                      |            |                    |                    |
|----------------------|------------|--------------------|--------------------|
| Dimensions L x W x H | approx. mm | 4520 x 2440 x 2400 | 5460 x 2560 x 2400 |
| Weight               | approx. kg | 13500              |                    |

Connected power max. 103 kW, 122 kVA, 180 A, 400 V, 50/60 Hz

Control INDEX C200-4D (based on Siemens 840D powerline)

# Technical data G400

## Work area

|                                      |         |             |             |                            |
|--------------------------------------|---------|-------------|-------------|----------------------------|
| Turning length                       | mm      | 1250 / 2000 |             |                            |
| Swing diameter                       | mm      | 630         |             |                            |
| <b>Main spindle, counter spindle</b> |         | <b>D90</b>  | <b>D102</b> | <b>D102</b>                |
| Bar capacity (max. bar diameter)     | mm      | 90          | 102         | 102                        |
| Spindle diameter bearing             | mm      | 140         | 170         | 170                        |
| Spindle head ISO 702/1               | Size    | 8           | 11          | 11                         |
| Chuck diameter                       | mm      | 315         | 400         | 400 (500*)                 |
| Speed                                | rpm     | 3500        | 3000        | 3000 (290*)                |
| Power at 100% / 40%                  | kW      | 43 / 57     | 50 / 70     | 53 / 67 (30 / (60*))       |
| Torque at 100% / 40%                 | Nm      | 275 / 363   | 918 / 1300  | 675 / 900 (1275 / (2000*)) |
| Alignment and indexing unit          | degrees | 2.5         | 2.5         | 2.5                        |
| C axis resolution                    | degrees | 0.001       | 0.001       | 0.001                      |
| Z axis rapid traverse                | m/min   | 30          | 30          | 30                         |

\* with additional drive 35% (only main spindle)

## Tool carrier 1 and 3

|                |       | <b>X</b> | <b>Z</b>    | <b>Y</b> | <b>B</b>        |
|----------------|-------|----------|-------------|----------|-----------------|
| Slide travel   | mm    | 320      | 1250 / 2000 | 210      | 360 (degrees)   |
| Rapid traverse | m/min | 20       | 40          | 10       | 180 (degr./sec) |

## Turret 1 and 3

|                                      |     |         |  |  |  |
|--------------------------------------|-----|---------|--|--|--|
| Number of stations                   |     | 12      |  |  |  |
| Cylindrical shaft mounting DIN 69880 | mm  | 40 x 63 |  |  |  |
| Tool drive speed                     | rpm | 6000    |  |  |  |
| Tool drive power at 25%              | kW  | 17      |  |  |  |
| Tool drive torque at 25%             | Nm  | 36      |  |  |  |

## Multi functional unit 1 and 3

|                       |     |  |  |  |  |
|-----------------------|-----|--|--|--|--|
| Tool system DIN 69893 |     | HSK-A63, HSK-B80, Capto C6 (optional)                  |  |  |  |
| Speed                 | rpm | 6000 / 1500  |  |  |  |
| Power at 25%          | kW  | 17   |  |  |  |
| Torque at 25%         | Nm  | 36 / 144   |  |  |  |
| Tool magazine         |     | max. 2 x 32 HSK-A63 / 2 x 24 HSK-B80 / 2 x 32 Capto C6 |  |  |  |

## Motor milling spindle 1 and 3

|                       |     |                          |  |  |  |
|-----------------------|-----|--------------------------|--|--|--|
| Tool system DIN 69893 |     | HSK-A63 / Capto C6       |  |  |  |
| Speed                 | rpm | 12000 / 18000 (optional) |  |  |  |
| Power at 100% / 25%   | kW  | 27.5 / 27.5              |  |  |  |
| Torque at 100% / 25%  | Nm  | 75 / 115                 |  |  |  |
| Tool magazine         |     | max. 4 x 20 HSK-A63      |  |  |  |
|                       |     | max. 2 x 20 Capto C6     |  |  |  |

## Tool carrier 2

|                |       | <b>X</b> | <b>Z</b>    |
|----------------|-------|----------|-------------|
| Slide travel   | mm    | 210      | 1250 / 2000 |
| Rapid traverse | m/min | 20       | 40          |

## Turret 2

|                                      |     |         |  |  |
|--------------------------------------|-----|---------|--|--|
| Number of stations                   |     | 10      |  |  |
| Cylindrical shaft mounting DIN 69880 | mm  | 40 x 63 |  |  |
| Tool drive speed                     | rpm | 6000    |  |  |
| Tool drive power at 25%              | kW  | 11.3    |  |  |
| Tool drive torque at 25%             | Nm  | 21      |  |  |

## Tailstock

|                |   |                         |  |  |
|----------------|---|-------------------------|--|--|
| Thrust         | N | 15000                   |  |  |
| Taper DIN 2079 |   | SK 30, SK 40 (optional) |  |  |

## Steady rest 1 and 2

|                |    |          |   |  |
|----------------|----|----------|---|--|
| Clamping range | mm | 35 - 220 | 22 - 150 (optional other clamping ranges) |  |
|----------------|----|----------|---|--|

## Dimensions, weight and connected power with maximum configuration

|                      |            |  |                    |  |
|----------------------|------------|--|--------------------|--|
| Dimensions L x W x H | approx. mm | 6150 x 2670 x 2635                             | 6900 x 2670 x 2635 |  |
| Weight max.          | approx. kg | 21000  |                    |  |
| Connected power      |            | max. 126 kW, 149 kVA, 218 A, 400 V, 50 / 60 Hz |                    |  |

## Control

|  |  |   |  |  |
|--|--|---|--|--|
|  |  | INDEX C200-4D (based on Siemens 840D powerline) |  |  |
|--|--|---|--|--|

# INDEX

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**INDEX-Werke GmbH & Co. KG**

**Hahn & Tessky**

Plochinger Straße 92

73730 Esslingen, Germany

Phone +49 (711) 3191-0

Fax +49 (711) 3191-587

[www.index-werke.de](http://www.index-werke.de)