G300, G320

Turn-mill centers for high-performance machining of medium-sized workpieces

better.parts.faster.
New dimensions in turning and milling

The INDEX G300/G320 is an innovative turn-mill center in a class of its own – especially when it comes to efficient production of medium-sized workpieces with high complexity and variance.

Based on a rigid and vibration-damping mineral-cast monoblock machine bed and large-dimension linear guides in X and Z axes, this series stands for modern mechanical engineering and thus for excellent machining results with high productivity. Three tool carriers with a tool pool of up to 141 tools provide maximum flexibility for complete machining of complex workpieces.

A total of up to 16 productive axes ensure impressive machining results without exception.
The machine concept

- Identical main and counter spindles with spindle clearance Ø 102 mm
- Chuck up to Ø 250 (Ø 315 mm)
- 3 tool carriers for up to 141 tools
- Powerful motor milling spindle with proven Y/B quill kinematics for complex 5-axis milling operations (G320)
- Sophisticated work area concept for turning lengths up to 1,400 mm and variable machining options
- High thermal and mechanical stability
- High acceleration and fast rapid traverse rates up to 50 m/mm
- Engineering excellence "Made in Germany"

The large work area is unique in this class and impresses with its sophisticated features that allow simultaneous machining using all three tool carriers with no collision risk. The smooth and steeply sloping stainless steel interior paneling ensures optimum chip flow. The chip conveyor can be mounted on the right or left side, depending on customer requirements.

The INDEX G300/G320 is relied on for the manufacture of a wide range of products in many industries such as machinery construction, automotive, and aerospace.
INDEX provides optimal solutions for flexible and efficient production. Throughout the product development process, INDEX engineers leverage years of experience from many industries. Products and processes are then tailored to specific customer needs through feasibility studies, efficiency analyses and, above all, close collaboration with the customer. Due to the modular design and high flexibility of INDEX products, customers receive a solution perfectly matched to their application.

**Best performance for applications in the automotive, aerospace, and machinery industries**

INDEX G300, G320

- **Motor housing**
  - Steel
  - 98 mm x 125 mm

- **Cup**
  - Aluminum
  - 110 mm x 120 mm

- **Tractor rear axle shaft**
  - Steel
  - 390 mm x 486 mm

- **Centrifuge**
  - Aluminum
  - 200 mm x 60 mm
The INDEX G300 and INDEX G320 turn-mill centers offer the best performance for customers from the machinery, automotive, and aerospace industries. Providing an ideal combination of productivity, flexibility and process reliability, the machine is a complete solution for high-performance machining of large workpieces.

**Rotor carrier**

- Steel
- 140 mm x 285 mm

**Nut housing**

- Steel
- 64 mm x 154 mm

**Bearing flange**

- Steel
- 129 mm x 136 mm

**Planetary gear for cutting machine**

- Steel
- 273 mm x 76 mm
Complete machining based on a modular system

The modular system in this series offers a wide range of options. Up to 3 tool carriers can be integrated into the work area, and all of them can be equipped with a Y axis. The work area offers ample space to machine any kind of workpiece, accommodating medium-sized parts up to 1,400 mm in length. The powerful main and counter spindles are designed for bar diameters up to 102 mm and for chuck part diameters of up to 315 mm. Turret steady rests are available for machining long or shaft-type parts.

The INDEX G320 features a powerful motor milling spindle capable of simultaneous 5-axis machining.

The ergonomic setup and operating concept played a major role in the new design. All the relevant components are easily accessible for operating and maintenance personnel. Optionally, an integrated workpiece handling system matched to the machining processes can be used for loading and unloading shaft and flange parts.

Furthermore, the modular robot cell iXcenter is available for all machines in this series, for flexible feeding and discharging of blanks and finished parts.
The components

Main and counter spindles
- Spindle clearance: Ø 102 mm
- Max. speed: 4,000 rpm
- 59 kW, 715 Nm (40% DC)
- Chuck diameter: Ø 250 mm (Ø 315 mm)

Upper turret with 12 stations (INDEX G300)
- 12 live stations, each VDI 40 with W-serration
- 5,400 rpm, 12 kW, 30 Nm (25% DC)
- X axis: 280 mm, rapid traverse rate 30 m/min
- Y axis: +/-80 mm, rapid traverse rate 20 m/min
- Z axis: 1,400 mm, rapid traverse rate 50 m/min

Two turrets with 12 stations each
- 12 live stations each, VDI 40 with W-serration
- 5,400 rpm, 12 kW, 30 Nm (25% DC)
- X axis: 180 mm, rapid traverse rate 30 m/min
- Y axis: +/-60 mm, rapid traverse rate 20 m/min
- Z axis: 1,400 mm, rapid traverse rate 50 m/min

Motor milling spindle (INDEX G320)
- HSK-T63: 18,000 rpm/12,000 rpm, 72 Nm/95 Nm (25% DC)
- Capto-C6: 18,000 rpm/12,000 rpm, 72 Nm/95 Nm (25% DC)
- X axis: 580 mm, rapid traverse rate 30 m/min
- Y axis: +135 mm/-115 mm, rapid traverse rate 20 m/min
- Z axis: 1,400 mm, rapid traverse rate 50 m/min
- B axis: -25°/+205°, rapid traverse rate 90 rpm

Tool magazine (INDEX G320)
- Single-row: 56 tool locations HSK-T 63/Capto-C6
- Double-row: 111 tool locations HSK-T 63/Capto-C6
- Max. tool weight: 8 kg
- Max. tool diameter: 125 mm
- Max. tool length: 400 mm
- Setup station
**Lower turret steady rests (optional)**
- Clamping range: 20 – 101 mm

**Workpiece handling unit for shafts (optional)**
- Integrated 2-axis workpiece handling unit
- Max. workpiece diameter: 120 mm
- Max. workpiece length: 800 mm
- Max. workpiece weight: 20 kg

**Workpiece handling unit for flanges (optional)**
- Integrated 3-axis workpiece handling unit
- Max. workpiece diameter: 200 mm
- Max. workpiece length: 150 mm
- Max. workpiece weight: 20 kg

**Upper turret with 15 stations (INDEX G300 optional)**
- 15 live stations, each VDI 30 with W-serration
- 7,200 rpm, 12 kW, 25 Nm (25% DC)
- X axis: 280 mm, rapid traverse rate 30 m/min
- Y axis: +/-80 mm, rapid traverse rate 20 m/min
- Z axis: 1,400 mm, rapid traverse rate 50 m/min

**Two lower turrets with 15 stations each (optional)**
- 15 live stations, each VDI 30 with W-serration
- 7,200 rpm, 12 kW, 25 Nm (25% DC)
- X axis: 180 mm, rapid traverse rate 30 m/min
- Y axis: +/-60 mm, rapid traverse rate 20 m/min
- Z axis: 1,400, rapid traverse rate 50 m/min
INDEX G300, G320

Large degrees of freedom in the work area for a wide variety of machining options

INDEX G320
Maximum productivity by simultaneous machining with 3 tools

INDEX G320
Use of tools up to 400 mm long in the motor milling spindle, e.g., for deep-hole drilling applications with the highest precision.

INDEX G300
Flexible shaft machining through the use of turret steady rests

INDEX G300, G320
Maximum freedom from collisions due to submergence of the lower tool carriers.
Tool magazine
with up to 111 tool locations HSK-T63/Capto-C6

Main spindle
Ø 102 mm/4,000 rpm/
525/715 Nm (100/40% DC)

Motor milling spindle
HSK-T63 or Capto-C6
Y-B quill
with torque motor for high precision

Tool turret
12 tool locations each /
VDI 40/5,400 rpm/
12 kW/30 Nm (25% DC)
Optional: Turret steady rest /
15 tool locations

Work area
with turning length 1,400 mm

Mineral cast bed
in monoblock design
for excellent rigidity and thermal stability
Work area
Vertical walls for optimum chip flow

Turret slides
with linear axes:
Y +/- 60 mm / X 180 mm

Counter spindle
Ø 102 mm/4,000 rpm/
525/715 Nm (100/40% DC)

Workpiece handling unit
for flange
up to 20 kg and Ø 200 mm/
length: 150 mm

Work area
Turning length 1,400 mm

Vertical walls for optimum chip flow
The cooling concept: efficient use of energy

Intelligent use of proven cooling principles:

- **Targeted heat dissipation**
  All heat-loss sources of the INDEX G300/G320 are cooled directly with different cooling media via multiple fluid circuits. The main spindle, counter spindle, tool carrier, hydraulic system and control cabinet each have a separate cooling circuit. The coolant directly absorbs lost heat energy and removes it from the machine.

- **Economical use of waste heat**
  The INDEX cold-water interface collects all of the heat loss energy in a central location where it can be recycled for another use. The captured energy can be applied to heating the facility, service water heating or process heating for other production steps. The recovery of machine waste heat enables a sustainable reduction of energy costs.

- **Climate-neutral dissipation of heat**
  If there is not an immediate use for the heat energy, the INDEX cold water interface provides the ability to dissipate it in a climate-neutral manner. By actually removing the head instead of just transferring it to the surrounding facility, a company can reduce the cost of its overall climate control.
Integrated automation solutions for efficient production

The integrated workpiece handling unit is available as an option. It can be used equally for loading and unloading as well as for the removal of remnants and is designed for parts weighing up to 20 kg and with a diameter of up to 120 mm (shaft) or 200 mm (flange). The handling unit is equipped with 2 or 3 CNC axes that are operated from the machine control.

Further individual automation solutions, such as conveyor belts or robot handling with ancillary functions can be integrated on a customer-specific basis.

Removal of finished parts (or feeding) using a workpiece-specific gripper for shaft or flange parts

2-axis workpiece handling system moves to the removal point without collision

3-axis workpiece handling for flange parts
Robot cell \textit{xcenter}  
\textbf{Intelligent automation – even more flexibility and efficiency}

With the iXcenter robot cell, blanks and finished parts can be fed and discharged quickly, safely, and flexibly. The overall sequence between the machine and the robot cell is created using predefined macros in the NC program. The sliding door in the machine’s work area access is provided to the robot via a sliding door which opens and closes automatically and the unit’s modular design offers the flexibility to integrate various processes. The iXcenter’s ease of access to spindles, tool carriers, and tool magazine makes you fully prepared to set up the machine.

\textbf{Your benefits}
\begin{itemize}
  \item Automatic and ergonomic workpiece feeding and discharge
  \item Modular basic cell that allows flexible expansion
  \item Low-manned continuous operation is possible
  \item Door designed for optimum access and view of the machine
  \item Compact design
  \item Modern INDEX machine design
  \item Entire system from one source
\end{itemize}

\textbf{Technical data}
\begin{itemize}
  \item 6-axis robot with 165 kg load capacity
  \item Reach 2,660 mm
\end{itemize}
Options available for the basic cell
- 6-axis robot with up to 270 kg load capacity
- Double grippers in flange and shaft versions
- Automatic gripper change, including gripper storage

Unlock more potential
Integration of downstream processes by attaching specialized modules

- Pallet/rack modules
- Cleaning stations
- Storage systems
- Deburring modules
- Circulating conveyors
- Laser marking modules
- Measuring units
- Additional customer-specific solutions
- Test modules
- Discharge units

Add on any configuration options available for the machine
- Internal handling (flange and shaft)
- Bar loading magazines
- Chip conveyors arranged left/right
Focus on production and control – Industry 4.0 included.
The iXpanel operating concept provides access to networked production. With iXpanel, your operator always has all relevant information for efficient production right at the machine. iXpanel is included with the standard version and can be enhanced with custom options. You can use iXpanel just as you require it for your business organization – that’s Industry 4.0 tailored to suit your needs.

Future-proof.
iXpanel integrates the latest control generation SIEMENS Sinumerik 840D solution line. Use iXpanel intuitively via an 18.5” touchscreen monitor.

Productive.
Maximum performance through comprehensive technology cycles and programming screens, e.g., for optimum turning, milling and drilling, especially when using several tools simultaneously.

Intelligent.
The machine always starts with the control home screen. Other functions can be displayed on a second screen at any time, and operators can enjoy direct, activity-related assistance already with the standard version, such as workpiece drawings, setup lists, programming aids, documentation, etc., and all this right at the machine.

Virtual & open.
With the optional VPC box (industrial PC), iXpanel opens up the world of the Virtual Machine with the 3 operating modes
- CrashStop
- RealTime mode
- Independent simulation (VM on board) directly in the control system.
Thanks to the VPC box, the machine can be integrated into your IT structure without any restrictions.
Virtual machine
3D simulation
VPC Box
Custom applications
VirtualPro programming studio
Custom machine
3D simulation
VPC Box
VirtualPro programming studio
Custom applications

STANDARD included as standard

Order documents
Customer data
Workpiece counter
Production status
Drawings
Setup sheet
VPC Box
Virtual machine 3D simulation

Notes
Information center
Maintenance & care
User management
Technology computer
Programming help
VirtualPro programming studio
Custom applications

+ many more standard features
INDEX G300, G320

INDEX G320 work area (with tool turret 15 x VDI 30)
Dimensions in mm

INDEX G320 work area (with tool turret 12 x VDI 40)
Dimensions in mm
INDEX G300, G320

Installation plan for INDEX G300/G320
Turning length 1,400 mm / chip conveyor at left and workpiece handling

Installation plan for INDEX G300/G320
Turning length 1,400 mm / chip conveyor at right
ixcenter with basic cell and pallet module
## Technical data

### Work area

<table>
<thead>
<tr>
<th>INDEX G300</th>
<th>INDEX G320</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turning length mm</td>
<td>1400</td>
</tr>
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### Main spindle and counter spindle

<table>
<thead>
<tr>
<th>INDEX G300</th>
<th>INDEX G320</th>
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<tbody>
<tr>
<td>Spindle clearance mm</td>
<td>102</td>
</tr>
<tr>
<td>Spindle nose ISO 702/1</td>
<td>A8</td>
</tr>
<tr>
<td>Max. speed rpm</td>
<td>4000</td>
</tr>
<tr>
<td>Drive power (100% / 40% DC) kW</td>
<td>44/59</td>
</tr>
<tr>
<td>Torque (100% / 40% DC) Nm</td>
<td>525/715</td>
</tr>
<tr>
<td>Chuck diameter mm</td>
<td>250 (315)</td>
</tr>
<tr>
<td>C axis resolution deg.</td>
<td>0.001</td>
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### Upper tool carrier

<table>
<thead>
<tr>
<th>INDEX G300</th>
<th>INDEX G320</th>
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</thead>
<tbody>
<tr>
<td>Kinematics</td>
<td>Turret</td>
</tr>
<tr>
<td>Tooling system</td>
<td>VDI30 // VDI40</td>
</tr>
<tr>
<td>Number of stations</td>
<td>15 // 12</td>
</tr>
<tr>
<td>Max. speed rpm</td>
<td>7,200 // 5,400</td>
</tr>
<tr>
<td>Drive power (100% DC) kW</td>
<td>12 // 12</td>
</tr>
<tr>
<td>Torque (25% DC) Nm</td>
<td>25 // 30</td>
</tr>
<tr>
<td>X slide travel, rapid traverse rate, feed force mm / m/min / N</td>
<td>280 / 30 / 9,000</td>
</tr>
<tr>
<td>Y slide travel, rapid traverse rate, feed force mm / m/min / N</td>
<td>+/ - 80 / 20 / 10,000</td>
</tr>
<tr>
<td>Z rapid traverse rate, feed force m/min / N</td>
<td>50 / 10,000</td>
</tr>
<tr>
<td>B axis swivel range, rapid traverse rate degrees / rpm</td>
<td>-25/+205 (+/- 115) / 90</td>
</tr>
</tbody>
</table>

### Tool carrier, bottom left/right

<table>
<thead>
<tr>
<th>INDEX G300</th>
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</thead>
<tbody>
<tr>
<td>Tooling system</td>
<td>VDI30 // VDI40</td>
</tr>
<tr>
<td>Number of stations (live), turret XYZ/XZ</td>
<td>15 // 12</td>
</tr>
<tr>
<td>Max. speed rpm</td>
<td>7,200 // 5,400</td>
</tr>
<tr>
<td>Drive power kW</td>
<td>12 // 12</td>
</tr>
<tr>
<td>Torque (25% DC) Nm</td>
<td>25 // 30</td>
</tr>
<tr>
<td>X slide travel, rapid traverse rate, feed force mm / m/min / N</td>
<td>180 / 30 / 9,000</td>
</tr>
<tr>
<td>Y slide travel, rapid traverse rate, feed force mm / m/min / N</td>
<td>+/- 60 / 20 / 10,000</td>
</tr>
<tr>
<td>Z slide travel, rapid traverse rate, feed force mm / m/min / N</td>
<td>1,400 / 50 / 10,000</td>
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### Tool magazine

<table>
<thead>
<tr>
<th>INDEX G300</th>
<th>INDEX G320</th>
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<tbody>
<tr>
<td>Tooling system</td>
<td>HSK-T63 // Capto-C6</td>
</tr>
<tr>
<td>Tool magazine locations (1 chain/2 chains)</td>
<td>56 / 111</td>
</tr>
<tr>
<td>Max. tool weight kg</td>
<td>8</td>
</tr>
<tr>
<td>Max. tool diameter mm</td>
<td>126</td>
</tr>
<tr>
<td>Max. tool length mm</td>
<td>400</td>
</tr>
<tr>
<td>Max. tilting torque Nm</td>
<td>12</td>
</tr>
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### Turret steady rest (optional)

<table>
<thead>
<tr>
<th>INDEX G300</th>
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<tbody>
<tr>
<td>Turret steady rest clamping range (with chip guard) mm</td>
<td>20 - 101</td>
</tr>
</tbody>
</table>

### Workpiece handling unit for shaft/flange (optional)

<table>
<thead>
<tr>
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<th>INDEX G320</th>
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</thead>
<tbody>
<tr>
<td>Workpiece weight, shaft/flange kg</td>
<td>20 / 20</td>
</tr>
<tr>
<td>Max. workpiece diameter, shaft (for discharge) mm (dia./length)</td>
<td>120 / 800</td>
</tr>
<tr>
<td>Max. workpiece diameter, flange (feeding/discharge) mm (dia./length)</td>
<td>200 / 150</td>
</tr>
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### General data

<table>
<thead>
<tr>
<th>INDEX G300</th>
<th>INDEX G320</th>
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<tbody>
<tr>
<td>Length x width x height mm</td>
<td>4,350 x 2,900 x 2,700</td>
</tr>
<tr>
<td>Weight t</td>
<td>23</td>
</tr>
<tr>
<td>Connected power kW</td>
<td>112</td>
</tr>
<tr>
<td>Control</td>
<td>Siemens S840D sl</td>
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