

# **G400, G420**

*Turn-mill centers for high-performance  
machining of large workpieces*

# INDEX



*better.parts.faster.*

## New dimensions in turning and milling

The INDEX G400/G420 is an innovative turn-mill center in a class of its own – especially when it comes to efficient production of large workpieces with high complexity and variance.

Based on a rigid and vibration-damping machine bed in mineral cast block design and generously dimensioned 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 139 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 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 vertically sloping interior paneling ensures optimum chip flow. The chip conveyor can be mounted on the right or left side, depending on customer requirements.

The INDEX G400/G420 is relied on for the manufacture of a wide range of products in many industries such as machinery construction, automotive and aerospace.

### The machine concept

- Identical main and counter spindles with spindle clearance 120 mm in dia.
- Chuck up to 400 mm in dia.
- 3 tool carriers for up to 139 tools
- Powerful motorized milling spindle with proven Y/B quill kinematics for complex 5-axis milling operations (G420)
- Sophisticated work area concept for turning lengths up to 1,600 / 2,300 mm and variable machining options
- High thermal and mechanical stability
- High dynamic response (rapid traverse rate up to 50 m/min)

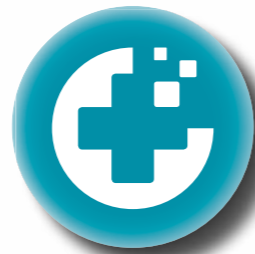


## Best performance for applications in the automotive, medical, aerospace, and machinery industries

INDEX offers its customers optimal solutions for flexible and efficient production. INDEX engineers have leveraged years of experience from many industries in their product development. Products and processes are made ready for commercial

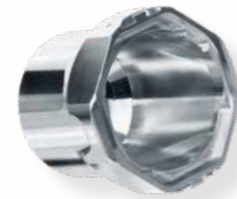
production through feasibility studies, efficiency analyses and, above all, through close collaboration with customers. Due to the modular design and the great flexibility of INDEX products, customers can also utilize an extensive modular system.

The INDEX G400 and INDEX G420 turn-mill centers offer the best performance for customers from the machinery, automotive, and aerospace industries, with high availability and process reliability – the most comprehensive solution when it comes to high-performance machining of large workpieces.



**Shaft**

Steel  
60 mm x 510 mm



**Cup**

Aluminum  
110 mm x 120 mm



**Rotor carrier**

Steel  
140 mm x 285 mm



**Flange**

Steel  
178 mm x 120 mm



**Shaft**

Steel  
60 mm x 320 mm



**Centrifuge**

Aluminum  
200 mm x 60 mm



**Bearing flange**

Steel  
129 mm x 136 mm



**Turret head**

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 these can be equipped with a Y axis.

The work area offers ample space to machine any kind of workpiece. The working range allows for parts up to 1,600/2,300 mm in length.

The powerful main and counter spindles are designed for bar diameters up to 120 mm and for chucked parts up to 400 mm in dia.

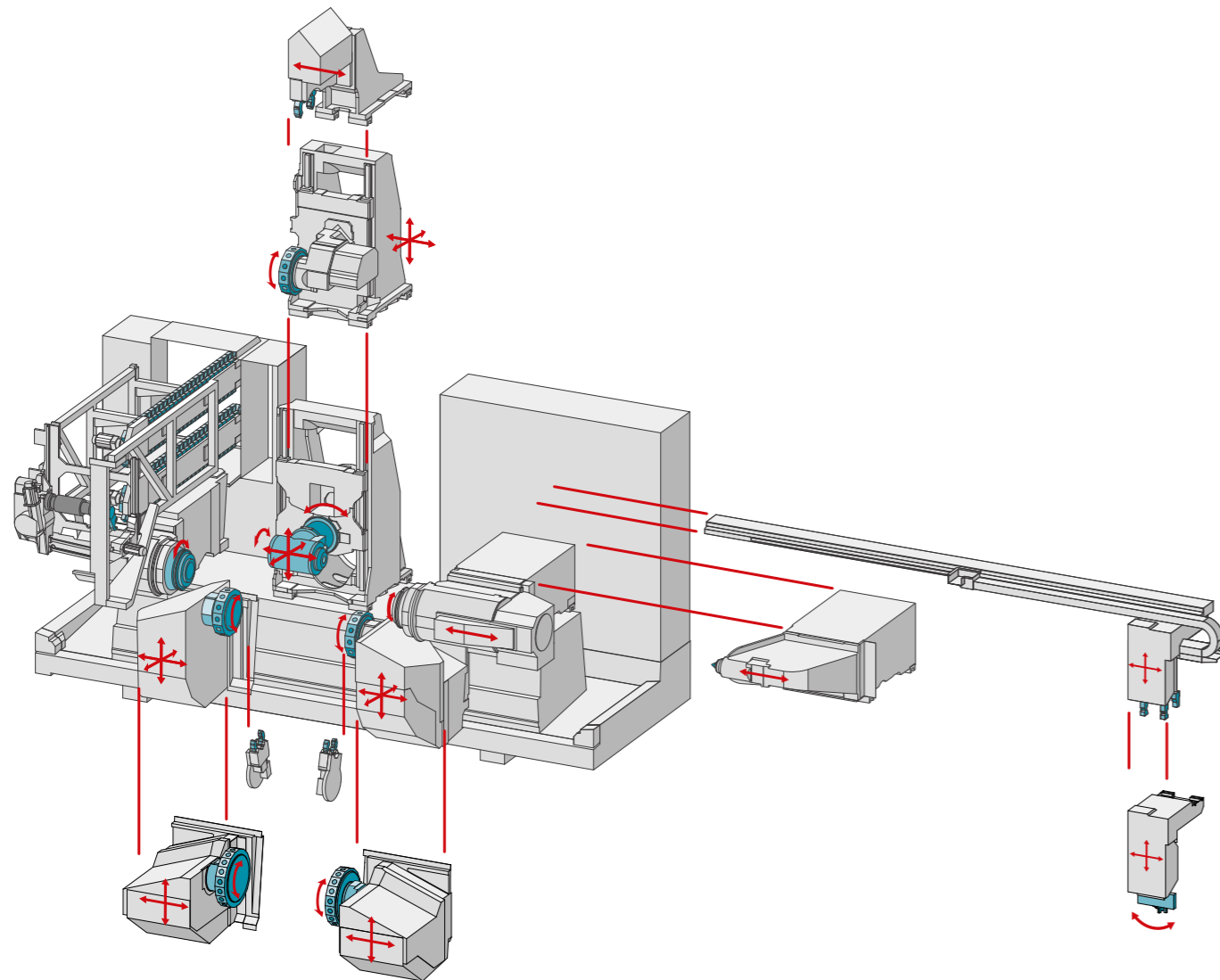
Turret steady rests are available for machining long or shaft-shaped parts.

Of course, the INDEX G420 is equipped with a powerful INDEX motorized milling spindle and is capable of simultaneous 5-axis machining.

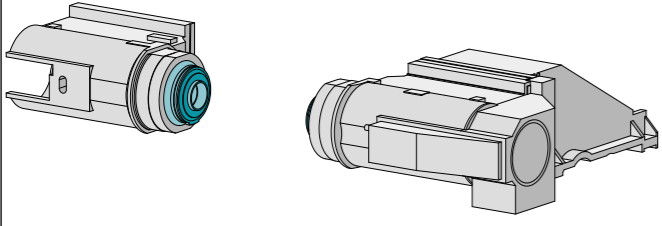
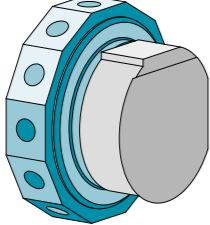
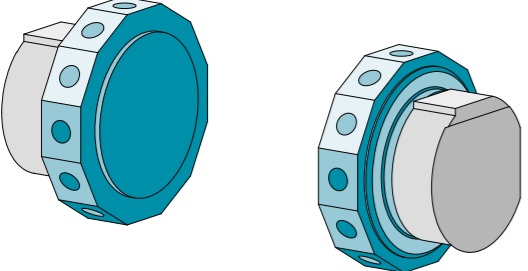
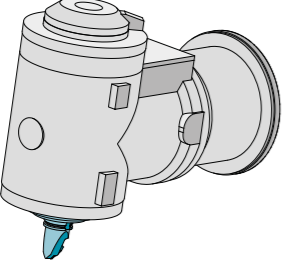
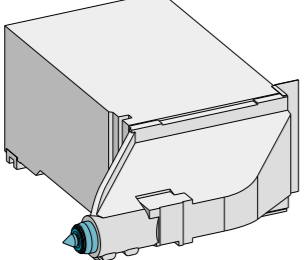
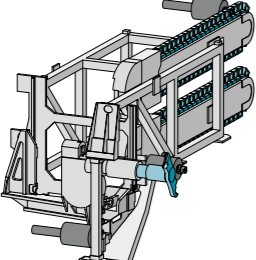
The ergonomic setup and operating concept played a major role in the new design.

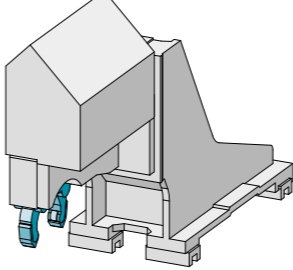
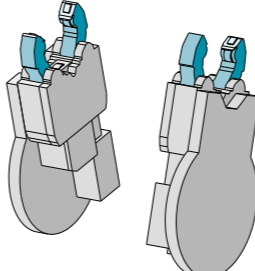
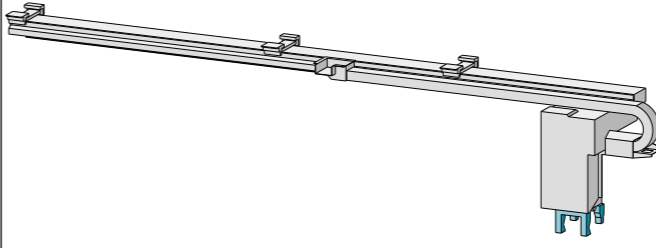
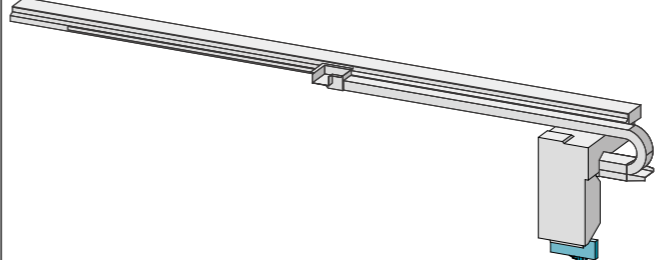
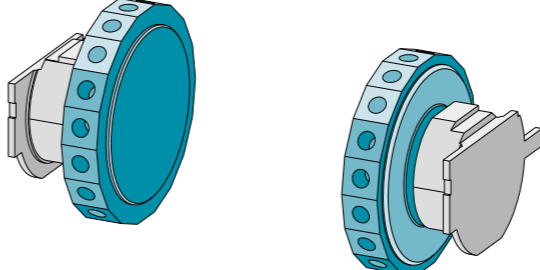
All the relevant components are easily accessible for operating and maintenance personnel. Optionally, an integrated workpiece handling system matched to the machining processes can be used for loading and unloading shaft and flange parts.

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

	<p><b>Main and counter spindles</b></p> <ul style="list-style-type: none"> <li>• Spindle clearance dia. 120 mm</li> <li>• Max. speed 3,000 rpm</li> <li>• 43 kW, 1,000 Nm (40% DC)</li> <li>• Chuck diameter 400 mm</li> </ul>
	<p><b>Upper turret (INDEX G400)</b></p> <ul style="list-style-type: none"> <li>• 12 live stations, each VDI 40 with W-serration</li> <li>• 5,400 rpm, 10.5 kW, 35 Nm (25% DC)</li> <li>• X axis 295 mm, rapid traverse rate 30 m/min</li> <li>• Y axis +/-100 mm, rapid traverse rate 20 m/min</li> <li>• Z axis 1,580 mm / 2,290 mm, rapid traverse rate 50 m/min</li> </ul>
	<p><b>Two lower turrets with 12 stations each</b></p> <ul style="list-style-type: none"> <li>• 12 live stations, each VDI 40 with W-serration</li> <li>• 5,400 rpm, 10.5 kW, 35 Nm (25% DC)</li> <li>• X axis 185 mm, rapid traverse rate 30 m/min</li> <li>• Y axis +/-70 mm, rapid traverse rate 20 m/min</li> <li>• Z axis 1,600 / 2,300 mm, rapid traverse rate 40 m/min</li> </ul>
	<p><b>Motorized milling spindle (INDEX G420)</b></p> <ul style="list-style-type: none"> <li>• HSK-T63, 12,000 rpm, 150 Nm (25% DC)</li> <li>• Capto-C6, 18,000 rpm, 100 Nm (25% DC)</li> <li>• X axis 750 mm, rapid traverse rate 30 m/min</li> <li>• Y axis +/-170 mm, rapid traverse rate 20 m/min</li> <li>• Z axis 1,600 / 2,300 mm, rapid traverse rate 50 m/min</li> <li>• B axis -25°/+205°, rapid traverse rate 75 rpm</li> </ul>
	<p><b>Tailstock</b></p> <ul style="list-style-type: none"> <li>• SK40 mounting</li> <li>• Pressing force 9,000 N (100% DC)</li> <li>• Rapid traverse rate 40 m/min</li> </ul>
	<p><b>Tool magazine (INDEX G420)</b></p> <ul style="list-style-type: none"> <li>• Single-row: 58 tool locations HSK-T 63 / Capto-C6</li> <li>• Double-row: 115 tool locations HSK-T 63 / Capto-C6</li> <li>• Max. tool weight 10 kg</li> <li>• Max. tool diameter 160 mm</li> <li>• Max. tool length 500 mm</li> <li>• Setup station</li> </ul>

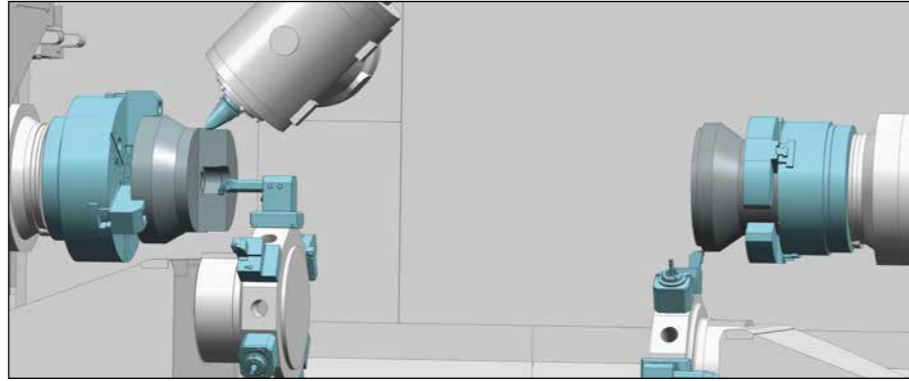
	<p><b>Upper steady rest on separate slide (optional)</b></p> <ul style="list-style-type: none"> <li>• Clamping range 12 - 152 mm / 30 - 245 mm</li> </ul>
	<p><b>Lower turret steady rests (optional)</b></p> <ul style="list-style-type: none"> <li>• Clamping range 20 - 101 mm / 50 - 131 mm</li> </ul>
	<p><b>Workpiece handling unit for shafts (optional)</b></p> <ul style="list-style-type: none"> <li>• Integrated 2-axis workpiece handling unit</li> <li>• Max. workpiece diameter 120 mm</li> <li>• Max. workpiece length 1,000 mm</li> <li>• Max. workpiece weight 25 kg</li> </ul>
	<p><b>Workpiece handling unit for flanges (optional)</b></p> <ul style="list-style-type: none"> <li>• Integrated 3-axis workpiece handling unit</li> <li>• Max. workpiece diameter 250 mm</li> <li>• Max. workpiece weight 20 kg</li> <li>• Max. workpiece length 200 mm</li> </ul>
	<p><b>Two turrets with 18 stations each (optional for INDEX G400)</b></p> <ul style="list-style-type: none"> <li>• 18 live stations each, VDI 40 with W-serration</li> <li>• 5,400 rpm, 10.5 kW, 35 Nm (25% DC)</li> <li>• X axis 210 mm, rapid traverse rate 30 m/min</li> <li>• Z axis 1,600 / 2,300 mm, rapid traverse rate 40 m/min</li> </ul>



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

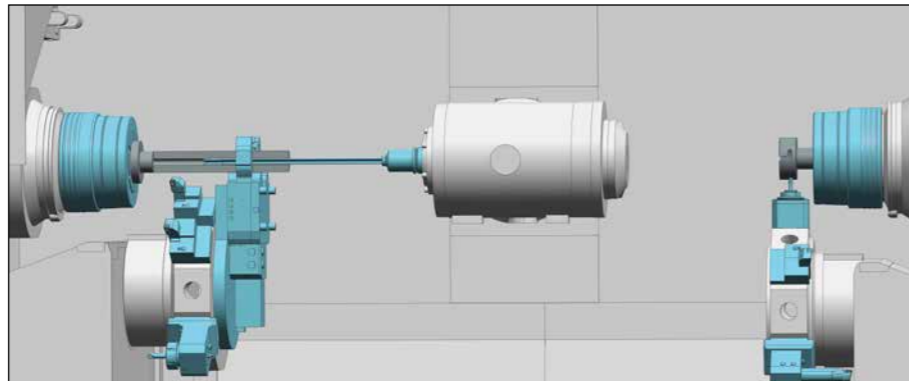
### INDEX G420

Maximum productivity by simultaneous machining with 3 tools



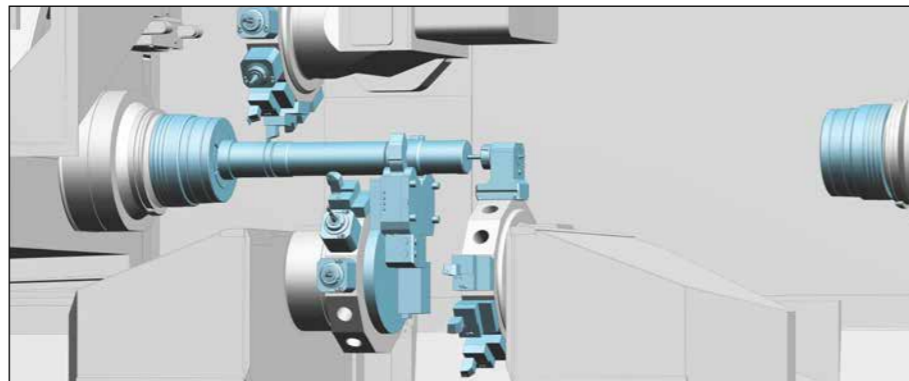
### INDEX G420

Use of tools up to 500 mm long in the motorized milling spindle, e.g., for deep-hole drilling applications with the highest precision.



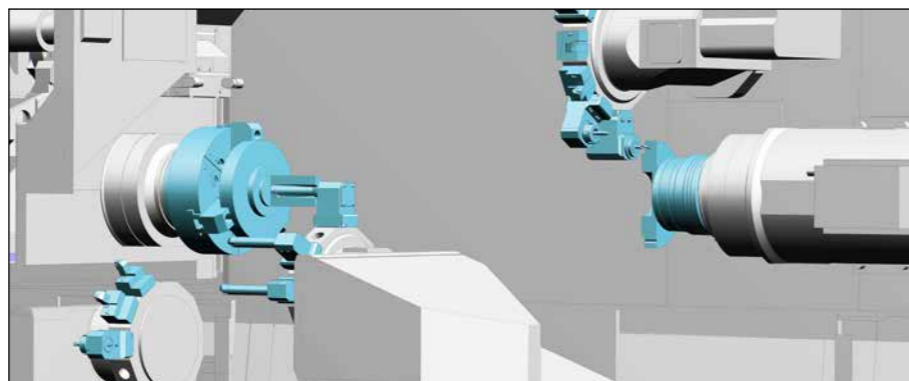
### INDEX G400

Flexible shaft machining through the use of turret steady rests



### INDEX G400

Maximum freedom from collisions due to "submergence" of the lower tool carriers.





**Motorized milling spindle**  
HSK-T63 or Capto-C6

**Tool magazine**  
with up to 115 tool  
locations HSK-T63 / Capto-C6

**Work area**  
Vertical walls for optimum  
chip flow

**Y-B quill**  
with torque motor  
for high precision

**Workpiece handling unit**  
with either a shaft gripper or  
a flange gripper up to 20 kg  
and 120 mm / 250 mm in dia.

**Main spindle**  
Dia. 120 mm / 3,000 rpm /  
800/1,000 Nm (100/40% DC)

**Working range**  
with turning lengths  
1,600 mm / 2,300 mm

**Counter spindle**  
Dia. 120 mm / 3,000 rpm /  
800/1,000 Nm (100/40% DC)

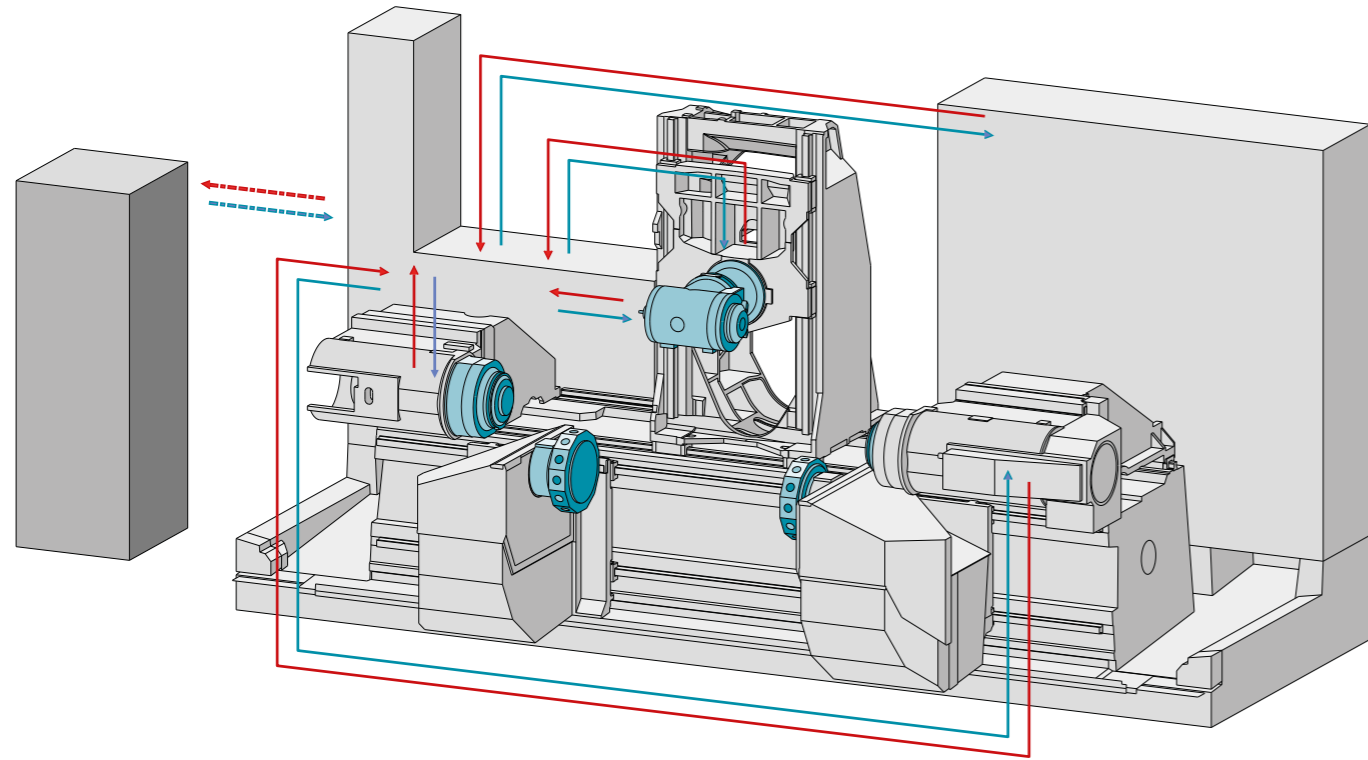
**Tool turret**  
12 tool locations each /  
VDI 40 / 5,400 rpm /  
10.5 kW / 35 Nm (25% DC)  
Optional: Turret steady rest

**Turret slides**  
with linear axes:  
Y +/-70 mm / X 185 mm

**Mineral cast bed**  
in block design for excellent  
rigidity and thermal stability



## The cooling concept: efficient use of energy



### Intelligent use of proven cooling principles:

- **Targeted heat dissipation**

All high-loss heat sources of the INDEX G400/G420 are cooled directly by multiple fluid circuits. In addition to the cooling circuits for the main spindle, counter spindle, motorized milling spindle, and the torque drive of the B axis, there is also a separate cooling circuit for the hydraulic system and

control cabinet. The lost heat energy is absorbed directly in the coolant and removed from a central location of the machine.

- **Economic use of waste heat**

The INDEX "cold water interface" allows the heat loss energy stored in the cooling medium to be removed from a central location and conveyed for another use, if required, e.g., production hall heat-

ing service water heating, or process heating for other production steps. The recovery of machine waste heat enables a sustainable reduction of energy costs in the company.

- **Climate-neutral dissipation of heat**

The cold water interface provides the ability to dissipate heat in a climate-neutral manner, if the machine waste heat stored in the cooling medium

cannot be used otherwise. The necessary cooling unit can be used with the help of the water interface first on the outside of the production hall and secondly also centrally for several machines. This offers a considerable energy savings potential for production hall heating dissipation/climate control or increased efficiency as a result of centralized heat disposal.

## Integrated automation solutions for flexible production



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

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 25 kg and with a diameter of up to 120 mm (shaft) or 250 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.



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



3-axis workpiece handling for flange parts



## Robot cell *xcenter*

**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, which opens and closes automatically, provides access to the robot. The iXcenter is modular in structure and allows you to efficiently 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.

### Your benefits

- Automatic and ergonomic workpiece feeding and discharge
- Modular basic cell that allows flexible expansion
- Low-manned continuous operation is possible
- Door designed for optimum access and view of the machine
- Compact design
- Modern INDEX machine design
- Entire system from one source

### Technical data

- 6-axis robot for 165 kg load capacity
- Reach 2,660 mm



### Unlock more potential

Integration of downstream processes by attaching specialized modules

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

### Add on any configuration options available for the machine

- Internal handling (flange + shaft)
- Bar loading magazines
- Chip conveyors arranged left/right

### 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





## The cockpit for easy integration of the machine in your business organization

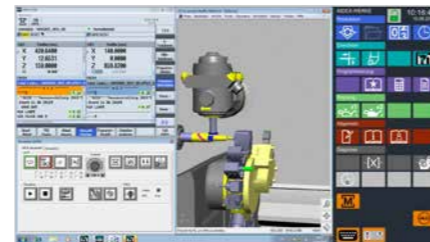
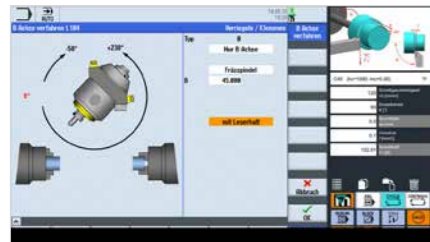


### Focus on production and control – Industry 4.0 included.

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 virtual machines with 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.

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



### STANDARD included as standard



Order documents



Customer data



Workpiece counter



Production status



Drawings



Setup sheet



Notes



Information center



Maintenance & care



User management



Technology computer



Programming help

### OPTION



VPC Box



Virtual machine 3D simulation



VirtualPro programming studio



Custom applications

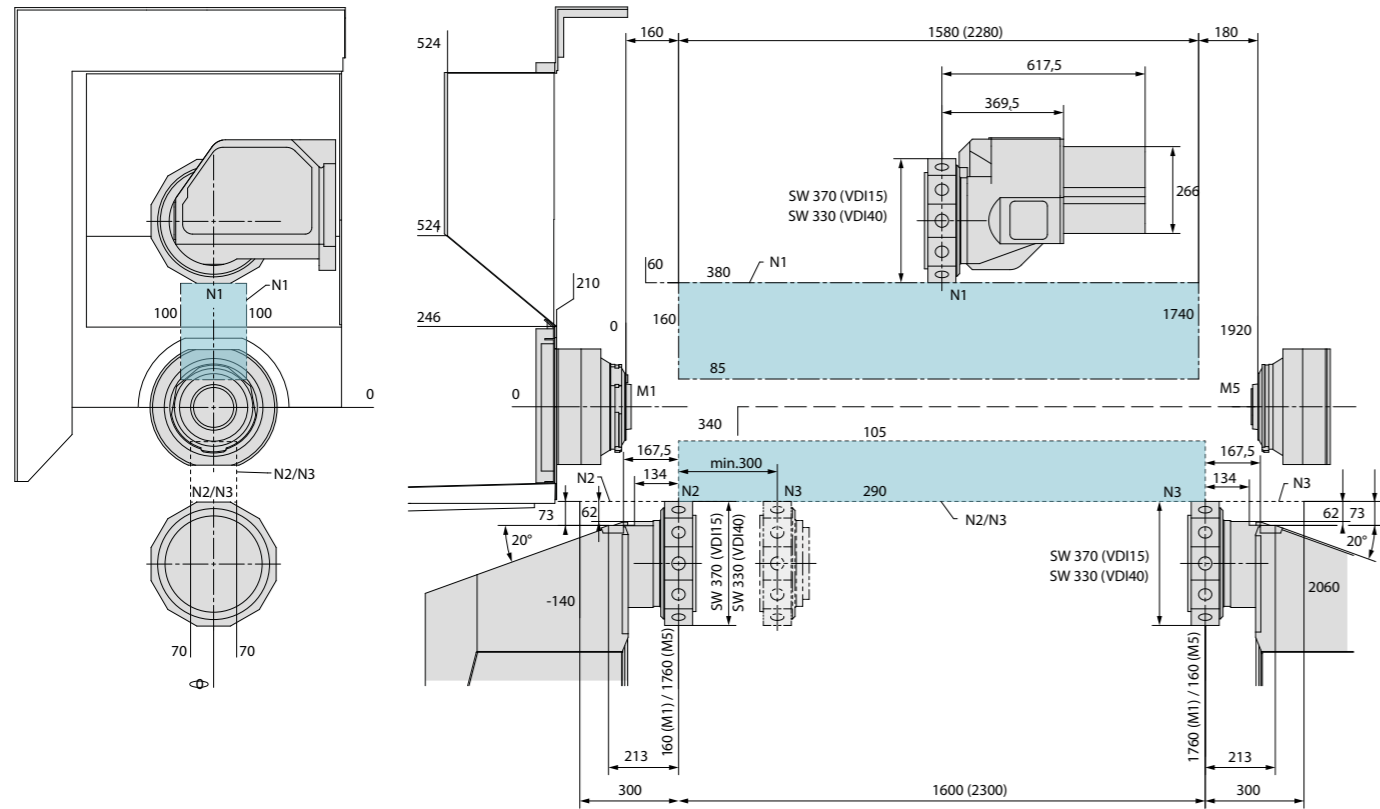
Industry 4.0 features

+ many more standard features

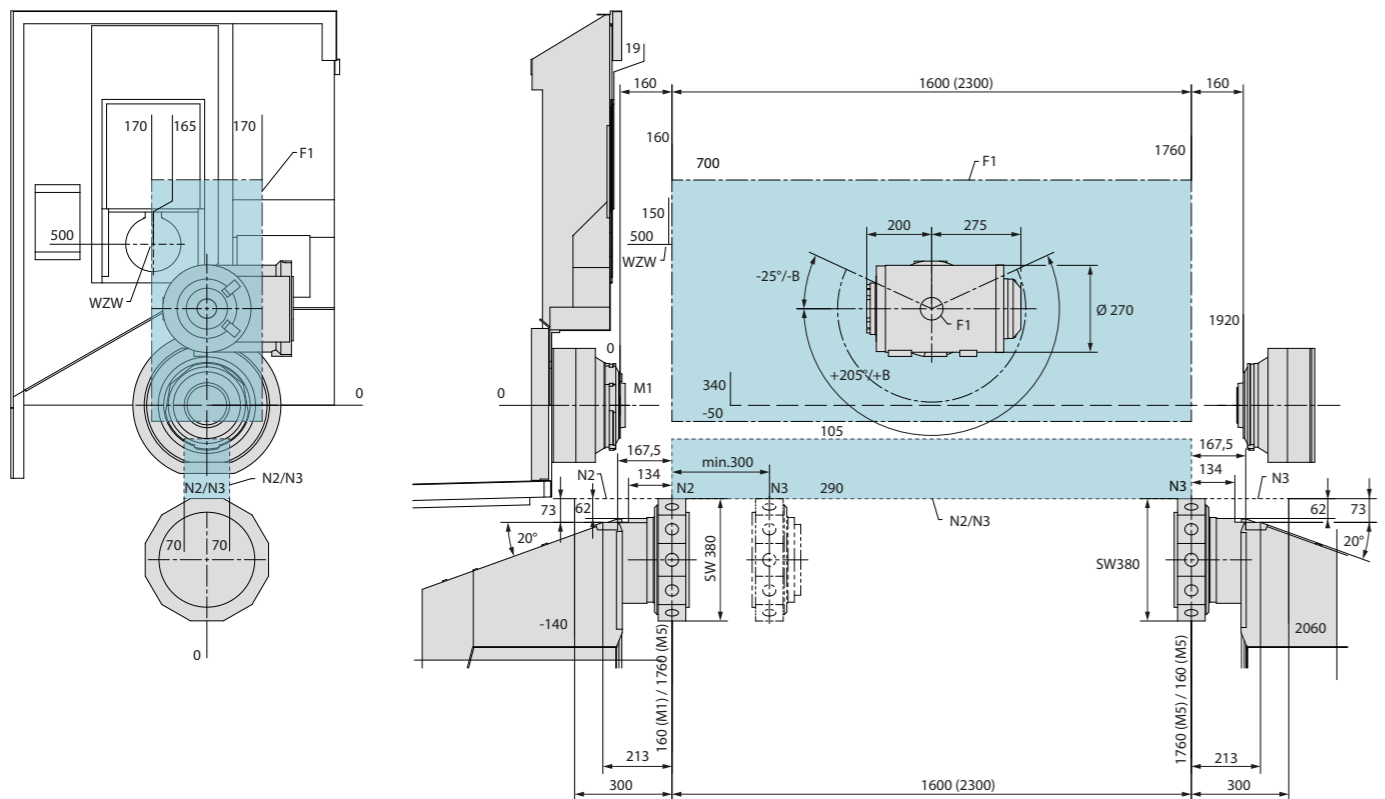


**INDEX G400, G420**

**Work area INDEX G400** - Turning length 1,600 mm (2,300 mm) -  
Dimensions



**Work area INDEX G420** - Turning length 1,600 mm (2,300 mm) -  
Dimensions



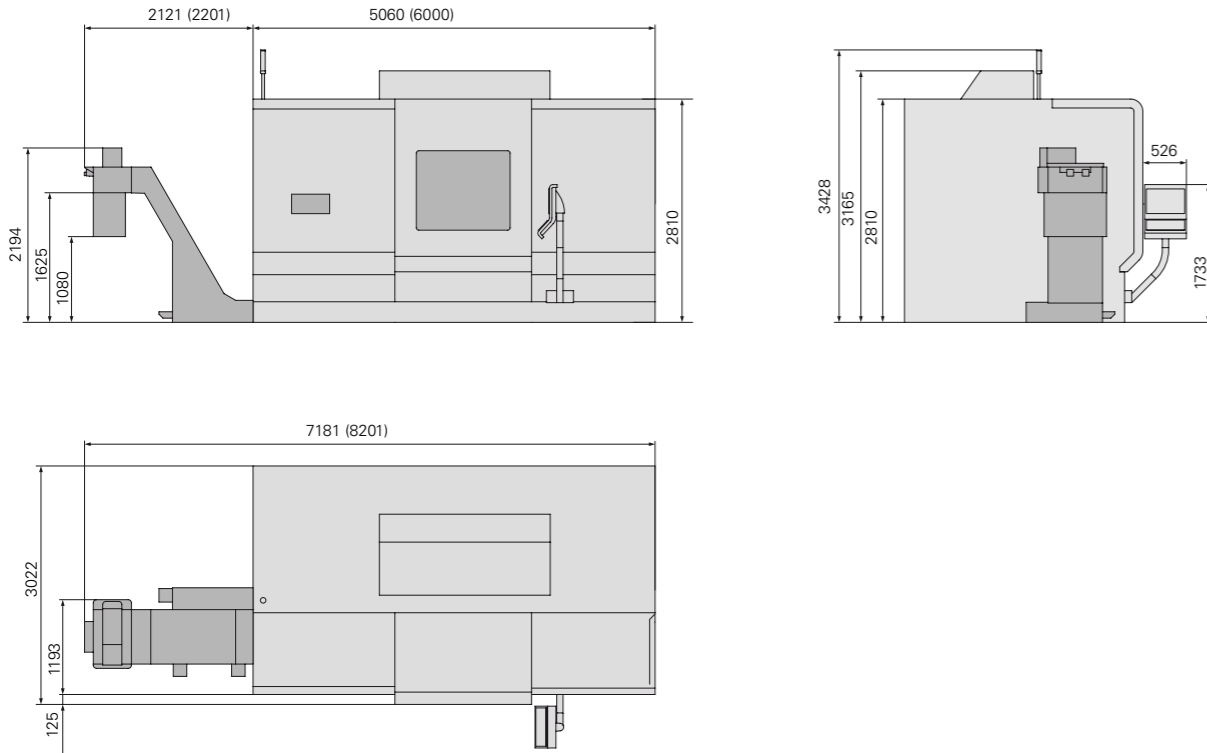
Automatic tool change with up to 115 HSK-T63 / Capto-C6 tool locations



## INDEX G400, G420

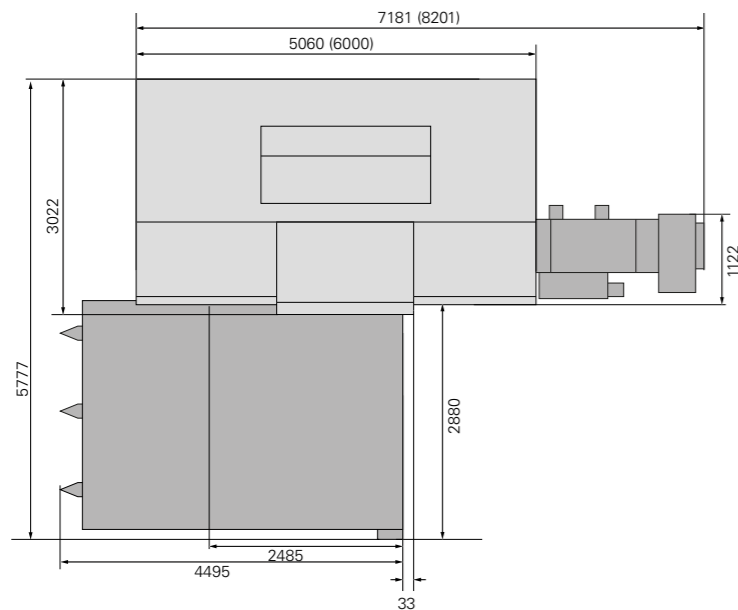
### Installation plan for INDEX G400/G420

Turning length 1,600 mm (2,300 mm) / chip conveyor at left and workpiece handling



### Installation plan for INDEX G400/G420

Turning length 1,600 mm (2,300 mm) / chip conveyor at right iXcenter with basic cell and pallet module



## Technical data

		INDEX G400	INDEX G420
<b>Working range</b>			
Turning length	mm	1,600	1,600
Turning length – long version	mm	2,300	2,300
<b>Main spindle and counter spindle</b>			
Spindle clearance	mm	120	120
Spindle head ISO 702/1		A11	A11
• Max. speed	rpm	3,000	3,000
• Drive power (100% / 40% DC)	kW	34/43	34/43
• Torque (100%/40% DC)	Nm	800/1,000	800/1,000
Chuck diameter	mm	400	400
C axis resolution	degrees	0.001	0.001
<b>Upper tool carrier</b>			
		Turret	Motorized milling spindle
Kinematics		XYZ	XYZB
Tooling system		DIN 69893-7 / ISO 26623	HSK-T63 // Capto-C6
Number of stations		12	
• Max. speed	rpm	5,400	12,000 // 18,000
• Drive power (100% DC)	kW	10.5	26 // 27.5
• Torque (25% DC)	Nm	35	150 // 100
X slide travel, rapid traverse rate, feed force	mm / m/min / N	295 / 30 / 10,000	750 / 30 / 10,000
Y slide travel, rapid traverse rate, feed force	mm / m/min / N	+/-100 / 20 / 11,000	+/-170 / 20 / 11,000
Z rapid traverse rate, feed force	m/min / N	50/11,000	50/11,000
B axis swivel range, rapid traverse rate	degrees/rpm		-25 / +205 / 75
<b>Tool carrier, bottom left/right</b>			
		Turret XYZ/XZ	Turret XYZ
Tooling system DIN 69880		VDI-40, W-serration	VDI-40, W-serration
Number of stations (live), turret XYZ/XZ		12/18	12
• Max. speed	rpm	5,400	5,400
• Drive power (25% DC)	kW	10.5/10.5	10.5
• Torque (25% DC)	Nm	35/35	35
X slide travel, rapid traverse rate, feed force	mm / m/min / N	Turret XYZ 185 / 30 / 10,000	185 / 30 / 10,000
X slide travel, rapid traverse rate, feed force	mm / m/min / N	Turret XZ 210 / 30 / 10,000	
Y slide travel, rapid traverse rate, feed force	mm / m/min / N	+/-70 / 20 / 11,000	+/-70 / 20 / 11,000
Z rapid traverse rate, feed force	m /min / N	40/11,000	40/11,000
<b>Tool magazine</b>			
Tooling system			HSK-T63 / Capto-C6
Tool magazine locations			58/115
Max. tool weight	kg		10
Max. tool diameter	mm		160
Max. tool length	mm		500
Max. tilting torque	Nm		15
<b>Turret steady rest (optional)</b>			
Turret steady rest clamping range (with chip guard)	mm	20 - 101 / 50 - 131	20 - 101 / 50 - 131
<b>Workpiece handling unit for shaft/flange (optional)</b>			
Workpiece weight, shaft/flange	kg	25/20	25/20
Max. workpiece diameter, shaft (for discharge)	mm (dia./length)	120/1,000	120/1,000
Max. workpiece diameter, flange (feeding/discharge)	mm dia./length	250/200	250/200
<b>General data</b>			
Length x width x height	mm	5,060 x 3,025 x 3,165	5,060 x 3,025 x 3,165
Length x width x height - long version	mm	6,000 x 3,025 x 3,165	6,000 x 3,025 x 3,165
Weight, short/long version	t	21/26	23/28
Connected power	kW	112	112
Control		Siemens S840D sl	Siemens S840D sl



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