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**TRAUB**

*better.parts.faster.*

# TURNINGpoint

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2017

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**PRODUCTIVE AND  
PRECISE**

AUTOMATION INCLUDED

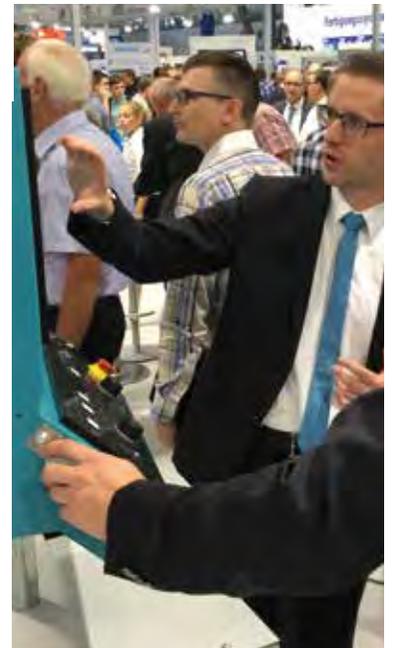
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**MAXIMUM PRODUCTIVITY**

Discover the world of machining with INDEX and TRAUB on 12,000 sq.ft. in **Hall 17 // Booth D03.**



Still need a ticket for the EMO in Hanover? Just send us an email to: [marketing@index-traub.com](mailto:marketing@index-traub.com)  
We look forward to your visit!



Dear customers and friends of the company,

Mobility is a key component, but also an important driver of our prosperity. In this respect, the occasionally heated discussions about diesel engines or the often suggested, digital transition to electric mobility is understandable. But the consequences are simple: emissions must be reduced. Purely electrically powered vehicles will certainly contribute to this goal in the future, but in the medium term and overall, the combustion engine has to meet this requirement. Downsizing, hybridization, turbocharging and direct injection for gasoline engines, camshaft timing, cylinder shutdown or more finely stepped automatic transmissions, etc. will play a major role here. The growing complexity of combustion engines drives the number of installed parts and thus the need for machining. Automotive suppliers, the electronics and machinery/plant construction industries will benefit from this trend. In addition, mobility in the air is increasing as well, which requires additional production capacity.

So there are reasons enough to offer you continued attractive solutions around turning. The center of our efforts has always been reliability: in terms of productivity, quality of parts, technical availability, and partnership. Against this background, we are introducing numerous new products that will be waiting for you at this year's EMO in Hanover.

The eight-spindle INDEX MS40-8 multi-spindle lathe opens up additional potential to improve productivity with its extended rear end machining unit options. Also our newly designed multi-spindle loading magazines contribute to higher productivity through their exceptional performance.

In the area of universal lathes, the new INDEX B400 will be celebrating its premiere, expanding the range of our solutions in turning.

The TRAUB TNL20-11, introduced recently at our Open House, will be presented in Hanover for the first time in its basic version TNL20-9 and with an optional B-axis. In combination with our flexible robot cell, Xcenter, completely new possibilities open up for your production. In addition to automatic workpiece handling and palletizing, you can integrate various systems for workpiece gauging with continuous process control.

Besides new machine developments, we are focusing on digitalization. The INDEX iX4.0 strategy aims to provide you new ways to improve efficiency and increase the utilization of your machines through transparency of state and process data. The already well established INDEX cockpit for iX4.0 applications will receive additional features for this purpose. In future, we want to support you and contribute to your success even better through intelligent data analysis.

Dr. Dirk Prust, Reiner Hammerl and  
Harald Klaiber  
Executive board

Premiere: TRAUB TNL20

# PRODUCTIVE AND PRECISE

The new sliding/fixed headstock automatic lathe TRAUB TNL20 was developed based on the proven TRAUB TNL series. It builds on well-known strengths such as power, ergonomics and flexibility. In addition, numerous improvements in productivity, accuracy, and automation have been implemented.

## 3 equipment options available

- TNL20-9 – two turrets
- TNL20-9B – with additional B-axis in the upper tool turret
- TNL20-11 – with additional front working attachment



## The machine design

- Bar capacity up to D 20 mm
- Powerful motorized spindles (max. 10,000 rpm,
- Up to 3 tool carriers and 1 back working attachment,
- High tool pool for setup-friendly production
- Optionally available with integrated robot cell Xcenter

## Highly dynamic & effective

Simultaneous machining with  
2, 3 or 4 tools



### iXpanel - i4.0 ready

- > 19" touchscreen
- > Based on: TRAUB TX8i-s V8
- > Industry 4.0 features
- > Gesture control
- > Included in the standard & individually expandable



More information:  
[index-traub.com/tnl20](https://index-traub.com/tnl20)



Play video  
> [index-traub.com/tnl20-video](https://index-traub.com/tnl20-video)  
or scan QR-Code



5.5 kW, 17.2 Nm)  
each with Y-axis



**Drive shaft**  
Dimensions: D14 x 100 mm  
Material: 1.4305  
Cycle time: 196 s



**Housing**  
Dimensions: D18 x 26 mm  
Material: Al  
Cycle time: 227 s

### New and yet established

The TRAUB TNL20 is a new development on the basis of the established TNL series that retains existing strengths and adds numerous improvements in productivity, precision, and automation.

### Design follows function

A first striking novelty is the attractive appearance of the sliding/fixed headstock automatic lathe TRAUB TNL20: the clearly structured exterior strictly follows the technical requirements. Basic characteristics valued by users of previous TRAUB designs, such as the large sliding guard at the front, are retained. It contains a generous, large inspection window to the work area, as well as a roller shutter that allows comfortable access to the main spindle and its periphery.

Despite the sleek outer design, excellent conditions for the setup of the machine are provided.

Another essential component of the new design is the control cabinet integrated completely into the machine cube. Any protruding elements are avoided, so that the right side of the machine is freely accessible for easy attachment of a bar loading magazine.

### Basis and concept

The basis of the TNL20 is a rugged, extremely rigid and vibration-damping cast iron bed. The generous and vertically designed work area also ensures the necessary degrees of freedom for the machining of workpieces, as well as very high process reliability by the free chip flow.

To increase the precision of the new TRAUB sliding/fixed headstock automatic lathes, the TNL20 is designed completely free of any hydraulic circuits. This favors high thermal stability and energy efficiency of the machine. The main and counter spindles are equipped with a pneumatically actuated dog clamping device that delivers a finely tunable clamping force, eliminates unwanted heat sources, is energy efficient, and reduces downtimes. It needs only 0.2 seconds for the clamping process.

### Versions of the TNL20

The sliding/fixed headstock lathe TRAUB TNL20 is built with three basic equipment options. They can be variably equipped and excel by their high productivity.

The basic equipment level is the TNL20-9, which has nine linear axes, two turrets each with 8 tool stations, a back working attachment with 4 tool stations, and an autonomous counter spindle. So already with the TNL20-9, you can use three tools simultaneously, resulting in increased productivity.

The TNL20-9B variant is equipped with an additional B-axis in the upper turret. It allows advanced and, above all, very complex machining operations.

With its additional front working attachment, the TNL20-11 has a second upper tool carrier with six stations. Three of them are live, one is equipped with a double holder. The front working attachment has an autonomous compound slide with X- and Z-axes, as well as an NC swivel axis. By its interpolation with the C-axis, a Y-axis function can be implemented. The back working attachment has been completely redesigned and has four tool mountings. It is easily accessible and well visible during setup and when testing a CNC program. The arrangement of the counter spindle and of the back working attachment ensures an optimal power flow for high accuracy during rear end machining.

The TNL20-11 provides a total 26 tool stations. With the use of double and triple holders, you can deploy up to 58 tools. The large tool pool allows economical machining of complex workpieces and machining of entire part families without tool changes and without major setup effort.

### Parts handling

With all 3 equipment options of the TNL20, small parts can be easily and quickly flushed out through an optional tube integrated in the lower turret to a conveyor belt installed on the right of the machine and carried away. A two-axis gantry unit is optionally used for larger workpieces. Long workpieces can be discharged through the counter spindle up to a length of 700 mm. Autonomous feeding from a pallet storage device in connection with a 6-axis articulated arm robot is made possible by the newly designed robot cell Xcenter.

### Technical data TNL20

#### Main/counter spindles

Max. bar capacity	20 mm
Max. speed	10,000 rpm
Max. output	5.5 kW
Max torque	17.2 Nm
C-axis resolution	0.001

#### Upper & lower tool turrets

Tool mountings	8
Mounting dia.	45 mm
Max. speed	12,000 rpm
Max. output	2.0 kW
Rapid traverse rate X / Y / Z	20 / 20 / 40 m/min

#### Back working attachment

Tool mountings	4
Slide travel X / Y / Z	120 / ±25.4 / 155 mm
Mounting dia.	25 mm



more info & specifications:  
[index-traub.com/tnl20](http://index-traub.com/tnl20)

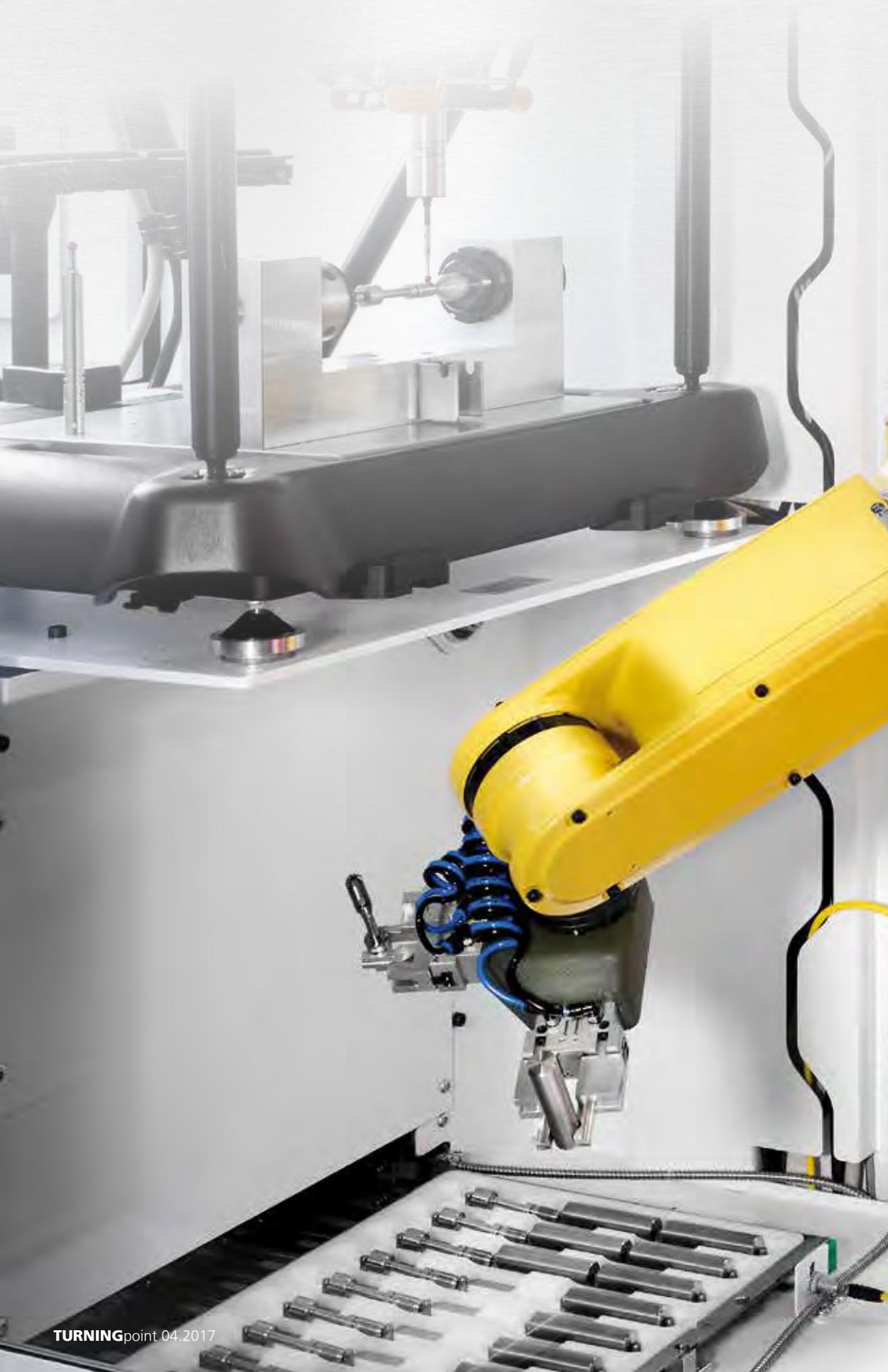
**Precise & efficient**  
Fluid spindle with up to  
50,000 rpm, perfect for  
drilling up to D 3 mm

**Highly dynamic & effective**  
TNL20-11:  
simultaneous machining with  
up to 4 tools

- Powerful motorized spindles**
- 10,000 rpm max.
  - 5.5 kW max.
  - 17.2 Nm max.
  - Fluid-cooled main and counter spindles
  - Spindle clearance up to D 20 mm

The new TRAUB TNL20 with integrated robot cell Xcenter

# AUTOMATION INCLUDED



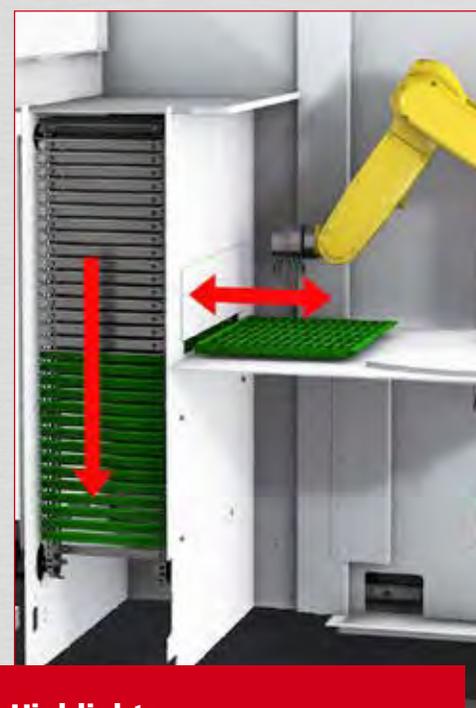
### Automation with Xcenter

The robot cell Xcenter, which is firmly connected and integrated with the machine, was developed for automated machining of sawing sections or pre-formed blanks. It consists of a 6-axis articulated arm robot and a vertical pallet storage device with 28 slots.

Of course, you can also instruct the robot to unload and store workpieces produced from bar stock in the pallet

storage device. For easy and ergonomic setup of the machine, the robot cell is completely movable, allowing unrestricted access to the work area.

The Xcenter robot cell also provides space to accommodate downstream processes such as measuring, deburring, cleaning, or labeling.



### Features Xcenter

- > integrated automation on the smallest footprint
- > very compact design
- > very good accessibility
- > flexible and versatile applications
- > quick handling by double gripper
- > 28 pallets, simple inlays
- > new material can be loaded during automatic operation without interrupting production
- > autonomous production in unmanned shift
- > higher machine utilization = faster ROI
- > stable operation, quality assurance through feedback of measurement results in optimal integration of measurement equipment
- > fast commissioning
- > no additional protective components required
- > easy in-house relocation

### Xcenter Highlights

- ✓ Handling of blanks larger than D 20 mm
- ✓ Discharge and storage of finished parts
- ✓ Articulated arm robot with 6 axes, 6 kg payload, integrated gripper control
- ✓ Pallet storage for up to 28 pallets, Pallet size 400 x 300 mm, Pallet height min. 25.4 mm
- ✓ Integration of other processes such as measuring, cleaning or deburring
- ✓ Preparation for a fully automated 3D measuring cell already included in the standard

The new universal lathe INDEX B400

# UNIVERSAL TURNING AT THE HIGHEST LEVEL

The newly developed CNC universal lathe is geared towards the manufacture of flange and shaft parts in small series down to 1 piece. In addition to the high level of quality, the INDEX B400 distinguishes itself especially through its ease of setup and beneficial ergonomics.



## iXpanel - i4.0 ready

- > 18.5" touchscreen
- > Based on: Siemens S840D sl
- > Industry 4.0 features

More details:

[index-traub.com/ixpanel](http://index-traub.com/ixpanel)

## Powerful main spindle

- > Bar capacity D 82 mm
- > Max. speed 4,000 rpm
- > Max. output 24 kW
- > Max. torque 516 Nm

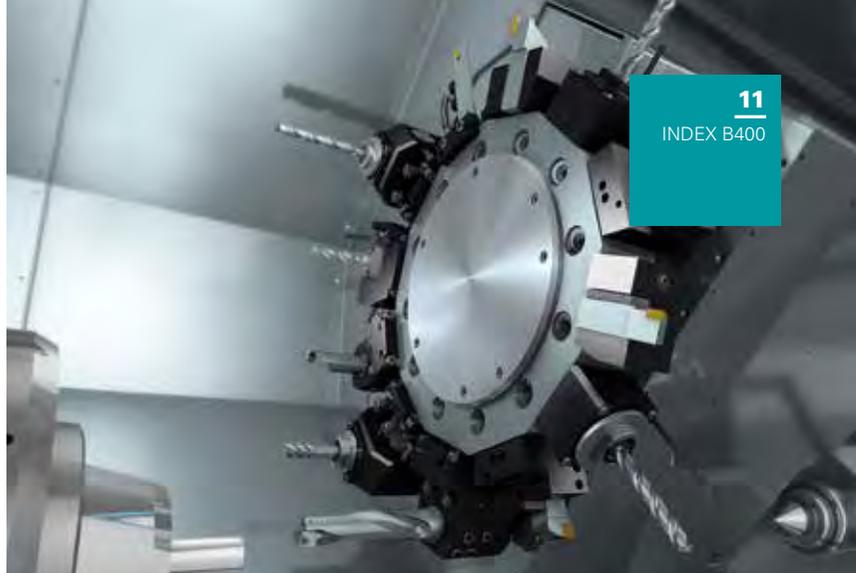


### Highlights & benefits of INDEX B400:

- ✓ Ergonomic design for easy operation and setup
- ✓ Monoblock slant machine bed made of mineral cast as the basis for high-precision machining
- ✓ Structured design of work area for a wide range of applications and optimized chip flow
- ✓ Radial turret for 12 tools with VDI 30 mountings and W-serration for high process reliability and repeatable setup accuracy
- ✓ NC tailstock with electrical axis
- ✓ Optionally expandable with bar package as well as programmable steady rest



More information:  
[index-traub.com/b400](http://index-traub.com/b400)



### Radial turret

- > 12 stations VDI30
- > W-serration for effective setup
- > Rapid traverse rate X/Y/Z: 40/20/40 m/min

### User-friendly

The new B400 appears in the new INDEX design: featuring a clearly structured cubic design, it follows the technical requirements. The operator benefits from the large viewing window on the front.

### Optimized chip flow

In the interior, a slant machine bed made of mineral cast and inclined by 45 degrees, with particularly vibration-damping properties, forms the basis for high-precision machining. It is designed as a monoblock, on which all the large-scale guides and components are installed. The slim overall cross-section allows the operator to carry out all setup work in comfortable proximity. Know-how accumulated over many years is evident in numerous details, such as in a pocket above the main spindle, which ensures collision-free use of long tools, or in guide bars that are screwed from below to achieve smooth surfaces in the work area.

### High torques

The main spindle generates very high torques of up to 516 Nm with a belt drive even at relatively moderate power output. The belt pull was deliberately placed in the Y-direction in order to keep the quality-defining X-axis, which is responsible for turning diameters, free of disturbances. Workpiece clamping is designed as partial hollow clamping. This

allows inserting workpieces up to a diameter of 80 mm and a length of 500 mm into the chuck. Another advantageous detail is the holding brake, designed as a disk brake, on the main spindle. It allows play-free clamping at any angular position.

### Easy setup thanks to W-serration

On the B400, a radial turret with VDI 30 mounting and W-serration is used as tool carrier. The W-shaped profile allows process-reliable and quick, effective setup of the basic holders for the twelve tools. The repeatability achieves results in the micron range. The tool turret can be moved not only on the compound slide in the X and Z directions, it also has a separate linear Y-axis.

For maximum accuracy, the X-axis is optionally available with a glass scale.

The spacious work area of the B400 offers a turning length of 750 mm. The turret can travel up to 265 mm in the X direction and up to 120 mm in the Y direction without restriction. Particularly interesting for many face milling and drilling operations is the large distance of 80 mm, which the tool can move "under the turning center".

### NC tailstock

The tailstock, which is running on generously dimensioned roller guides, is a purely electrical

assembly that can be positioned freely from the NC program. The drive is also used to generate the pressing force.

In the standard version, the tailstock is equipped with a Morse cone center MK 5 for centers and elements available on the market. Alternatively, a steep cone center SK 30 can be used. This INDEX design has a significantly more robust bearing and service life. To facilitate the setup, insertion aids for wave-shaped workpieces are available.

### Extended range of applications

The universality of the B400 does not stop at economic turning of medium and large lot sizes. For attaching a bar loader, INDEX provides an optional bar package, which consists of a hollow clamping cylinder and a workpiece removal unit. As a further option, INDEX offers for the B400 an electrically positionable, hydraulically operated NC steady rest, which can be useful for machining of long shafts. Its position can also be controlled from the CNC program.

### NC tailstock

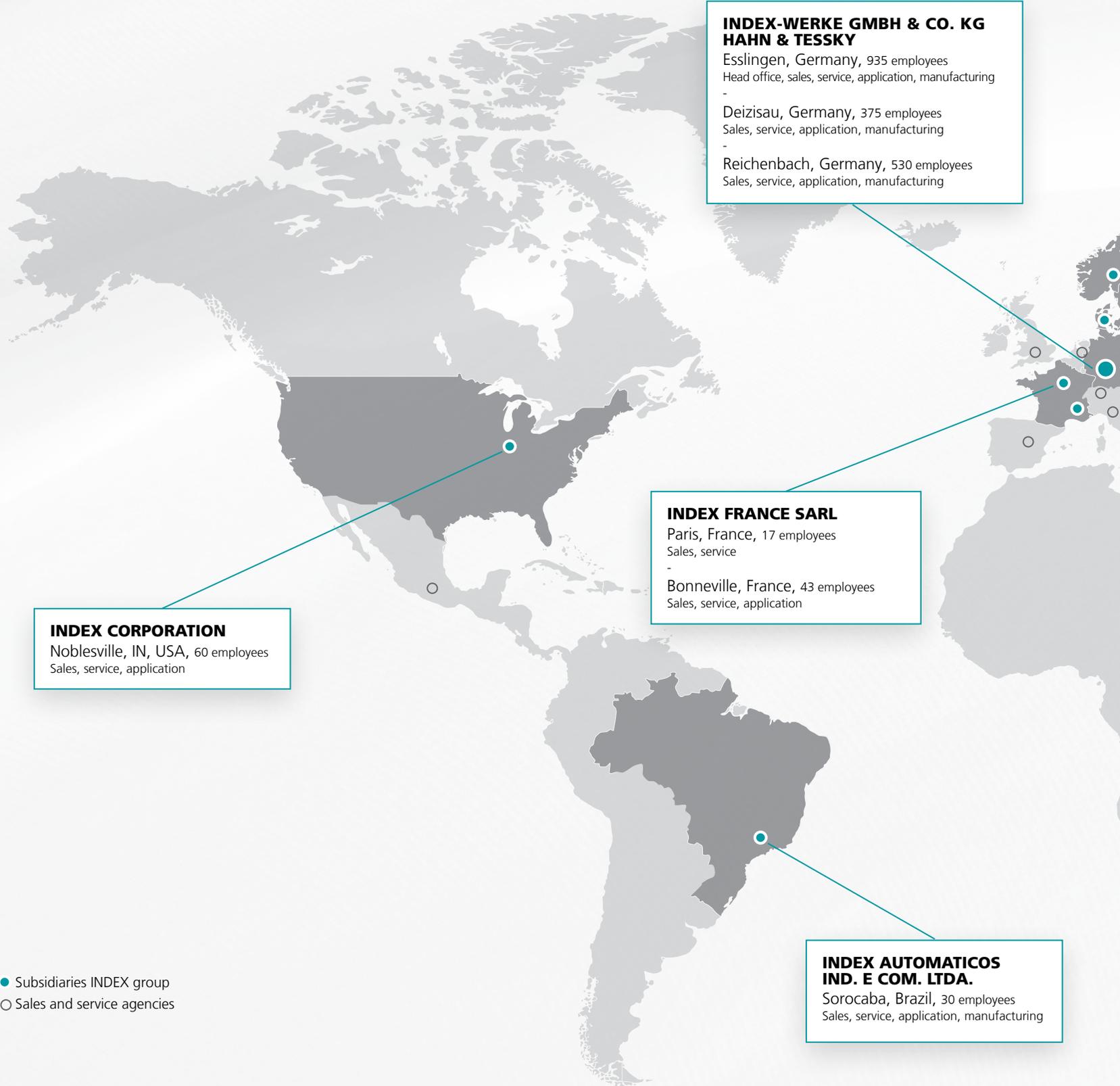
- > Purely electrical
- > Contact force 10,000 N
- > Rapid traverse rate max. 9 m/min



*Ergonomic operation and setup of the B400*

China in transition to a high-tech country

# ALL EYES ON CHINA



The INDEX group, with its INDEX and TRAUB brands, is represented with 8 subsidiaries and numerous agencies in over 60 countries around the world.

The Chinese market is already supported for more than 17 years by INDEX DALIAN Machine Tool Ltd., and since 2007 by another sales and service subsidiary in Shanghai. Two strong locations for

the upcoming challenges in China. Because the Chinese government has issued its goal to become the world's leading industrial nation by 2049 – 100 years after the founding of the People's Republic.

For this purpose, China has anchored sub-objectives in its "Made in China 2025" strategy. This strategy is part of a higher-level goal, which seeks to drive forward, for example, automation,

**INDEX TRAUB NORDIC AB**

Stockholm, Sweden 40 employees  
 Langeskov, Denmark  
 Helsinki, Finland  
 Oslo, Norway  
 Sales, service

**INDEX RUS**

Togliati, Russia, 3 employees  
 Sales, service, application

**GEMATECH S.R.O.**

Malacky, Slovakia, 50 employees  
 Application, manufacturing

**INDEX DALIAN MACHINE TOOL LTD.**

Dalian, China, 40 employees  
 Sales, service, application, assembly

-

**INDEX TRADING CO, LTD.**

Shanghai, China, 28 employees  
 Sales, service

networking and digitalization in 10 key industries such as robotics, electro-mobility, high-tech machinery, plant engineering, aerospace, and bio/medical technology.

To modernize its production facilities, China relies on purchasing foreign technologies. Here are opportunities for foreign high-tech companies that can serve such highly demanded fields as systems integration and intelligent factory equipment.

The INDEX group with its two sites in China is well equipped for this purpose.

> Find out more on the next two pages.



- 1** The team in Shanghai is ideally prepared for the demands in China
- 2** better.parts.faster. - Wide variety of realized customer parts
- 3** Modern demonstration center for the high-tech machines of INDEX & TRAUB
- 4** New office building in the Free Trading Zone in Shanghai
- 5** The technical sales team in the dialog with the customer
- 6** Continuing education plays a central role – Training by experts from Germany

#### FACTS & FIGURES – INDEX TRAUB IN CHINA

- > Sales and service location in Shanghai
- > 10,000 sq.ft. showroom
- > 4,300 sq.ft. office space
- > 28 employees
- > More than 600 spare parts always in stock
- > Additional sales site in Beijing
- > Production site in Dalian (INDEX Dalian Machine Tool) with 40 employees





2



## CONTACT

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> [www.index-traub.cn](http://www.index-traub.cn)

INDEX moves to new technology center in Shanghai

# NEW GLORY

Interview with Hongwen Li, since 2016 Managing Director of INDEX Trading Shanghai, about the new technology center and the future direction in China.

## Mr LI, what has impressed you most of INDEX China at the beginning?

INDEX has an excellent, professional and technically well-established team that has been covering the Chinese market already for a long time. In addition, we are capable of offering cutting edge technology with INDEX and TRAUB machines.

## How important is the Shanghai site for you?

As a center for finance, trade and commerce, Shanghai plays an extremely important role in China's economic development. With the Shanghai-based INDEX branch, we decided to set up a technology center in the free trade zone of Shanghai. This represents part of the requirements of INDEX's strategic development. The new technology center will offer a wide range of services not only to Chinese customers, but also to customers of the entire Asia-Pacific region.

## So the move to the new location was a logical step in this strategy?

With the move to more modern premises, we want to gradually develop the potential in the Chinese market to serve customers even better. We therefore want to reflect the premium image of INDEX and TRAUB high-tech products also by our premises. We moved to our new office and technology center in Shanghai in March of this year. The new technology center is now equipped with turn-mill centers, production lathes, and multi-spindle automatic lathes. Machines of the TNL series will be added in the future. This has very positive impacts. For example, we can now provide process concepts and turning tests to customers even faster and offer better service and more hands-on training. This establishes a strong basis for further developing the Asian market.

## This requires qualified personnel. How do you ensure technical training of employees in China?

In 2016, we have started to train our customer service technicians and process engineers strategically in many ways. For example, we send them to our headquarters in Germany, and German engineers come to us in Shanghai to intensively train our customer service technicians and process engineers on site.

## What is your opinion on the future requirements of the Chinese market?

With the development of the Chinese economy, the level of technology of the Chinese manufacturing industry is rising immensely, making huge steps towards intelligent manufacturing and Industry 4.0. The requirements for vendors and facilities are thus further increasing. INDEX and TRAUB machines are high-tech products with high precision, efficiency and quality for our high-level customers. The products are in line with the future development of the Chinese market in terms of networking, digitalization and systems integration. We are well positioned to assume our role in the rise of the Chinese manufacturing industry, to meet the requirements of intelligent production, and to achieve our targeted sales growth.



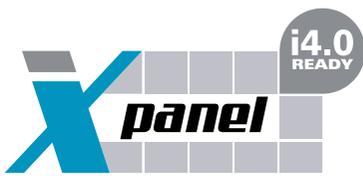
better.parts.faster.

Ideally equipped for Industry 4.0

# X4.0 CONNECTING YOUR FUTURE

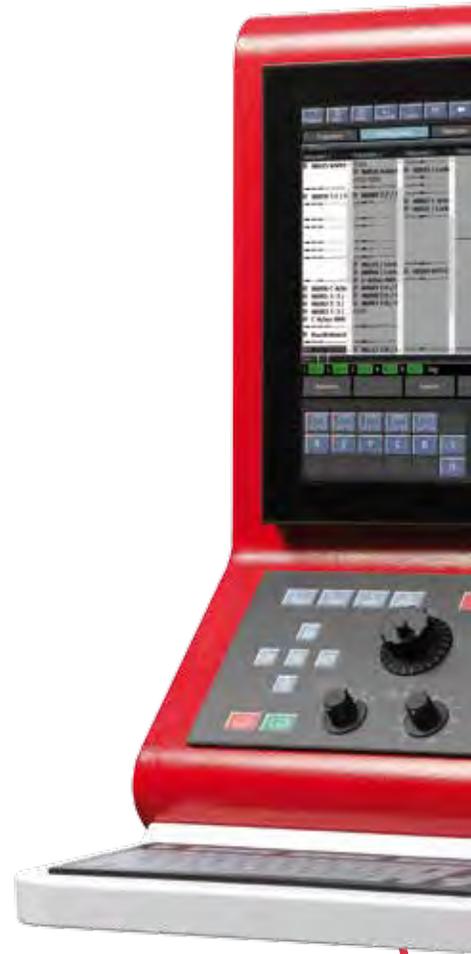
The future lies in digital, networked production. INDEX, with its operating concept iXpanel - i4.0, is already well equipped for this. iXpanel is the cockpit for easy integration of the machine in small, medium or large business organizations. With iXpanel, all relevant information is directly available at the

machine for economical production. iXpanel already comes as standard in all INDEX machines and now also in all new TRAUB models, and is individually expandable. Open up access to networked production and use iXpanel profitably according to your requirements – Industry 4.0 to measure.



## iXpanel - i4.0 ready

- 18.5" touchscreen
- Based on: Siemens S840D sl
- Industry 4.0 features



### STANDARD included as standard

Industry 4.0 features

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 simulations
- VirtualPro programming studio
- Custom applications



+ many more standard features

### STANDARD included as standard

Industry 4.0 features

Order documents	Customer data	Browser
Notes	Information center	Remote access

NETWORK  
SERVER  
APPLICATION

CUSTOMER



### iXpanel - i4.0 ready

- › 19" touchscreen
- › Based on: TRAUB TX8i-s V8
- › Industry 4.0 features

#### OPTION



Drawings



Setup sheet

- WinFlexIPS
- WinFlexIPS<sup>Plus</sup>
- Custom applications



User management



Technology computer



Programming help



+ many more standard features

[index-traub.com/ixpanel](http://index-traub.com/ixpanel)

Growth in the air

# AEROSPACE SOLUTIONS

Experts anticipate a doubling of passenger numbers to 7.2 billion passengers per year by 2035. In addition to the increase in production in the manufacture of aircraft and aircraft components, a rising level of innovation can also be expected. This in turn will cause an immense rise in the demand for components for the entire aerospace industry. A part producer can meet this demand only, if it opts for efficient and high-tech production methods for cost-optimized machining. The flexible machine tools and technological solutions of INDEX and TRAUB are ideally suited to product high-precision aircraft components for areas such as turbines, landing gear, chassis, and interior.



## Adjusting screw

Material: 3.1354  
Dimensions: D 30 mm x 120 mm  
Machine: **TRAUB TNL32 sliding headstock automatic**



Play video:  
> [index-traub.com/tnl32-video](http://index-traub.com/tnl32-video)



## Rotor holder

Material: 1.4542  
Dimensions: D 100 mm x 190 mm  
Machine: **INDEX G220 turn-mill center**



Play video:  
> [index-traub.com/g220-video](http://index-traub.com/g220-video)



## Titanium fork

Material: 3.7164  
Dimensions: D 50 mm x 180 mm  
Machine: **INDEX G200 turn-mill center**



Play video:  
> [index-traub.com/g200-video](http://index-traub.com/g200-video)



## Turbine blade

Material: 1.4305  
Dimensions: D 65 mm x 155 mm  
Machine: **INDEX R200 turn-mill center**



Play video:  
> [index-traub.com/r200-video](https://index-traub.com/r200-video)



## Connector housing

Material: AlMgSi1  
Dimensions: D 42 mm x 30 mm  
Machine: **INDEX C200 turning machine**



Play video:  
> [index-traub.com/c200-video](https://index-traub.com/c200-video)



## Tear-off screw

Material: X8CrNiS18-9  
Dimensions: D 22 mm x 25 mm  
Machine: **INDEX MS16 multi-spindle automatic lathe**



Play video:  
> [index-traub.com/ms16-video](https://index-traub.com/ms16-video)

# TEACHING PROCESSES TO FLY

Two years ago, a change in shareholders and managers at RO-RA Aviation Systems, a supplier to the aviation industry, led to a comprehensive paradigm shift. Today, customers enjoy unique services, partners such as INDEX enjoy future-oriented cooperation.



When Markus Kreisle and Helmut Wiesenberger took over the management of the Austrian aviation supplier RO-RA Aviation System in Schörfling in early 2015, their task was no less than to venture a new start – with the existing machine park, with the same staff, and within the familiar, clearly defined “aviation” field.

## In the beginning was the program

The turnaround has been achieved. There is no screw that Markus Kreisle and his managing partner Helmut Wiesenberger had not turned. Step one was the adop-

tion of the growth program “Seven up”, which aimed at increasing annual sales within seven years from then 13 to 100 million euros. In 2016, 33 million were achieved already.

Step two was establishing the new RO-RA claim “We want to be a no-me-too company.” Markus Kreisle explains these steps as follows: “Starting new as an aviation supplier required a paradigm shift at all levels. Because to avoid being driven by constantly aggravating market conditions, a company needs to anticipate trends at an early stage and delight its customers



More customer success stories  
can be found on our website:  
> [index-traub.com/success](https://index-traub.com/success)



#### Partners for unique manufacturing processes

(from left to right): Michael Czudaj and Franz Wimmer (both INDEX), Mladen Stanic, Alexander Heindl (both top technologists at RO-RA), Andi Springer (Head of RO-RA Technology Team), Hannes Schmid, Richard Kurz (both FutureZone employees at RO-RA), and RO-RA CEO Markus Kreisle in front of the INDEX turn-mill center G220 in the FutureZone.

© Hanser

quickly and flexibly with individualized products. The unique position behind the guiding principle of leaving trodden paths with creativity not only applies to the products, but also to the processes and the ethics of doing business.”

#### Diversifying and investing

To increase the value creation in the existing top-notch machine pool, high-quality products in the field of aviation had to be acquired. Jointly with experts, they decided for the demanding path towards production of safety-relevant components. This in turn required, in addition to a sales offensive, a particular technology initiative towards high-end processes. Kreisle: “We expanded our activities at five levels. First with regard to our customer base, whose expansion automatically led to a regional expansion as point two. Thirdly, we have conquered new segments in aircraft construction. Today, in addition to interior parts, we produce also customized components for the structure and engine in batch sizes down to the individual part. Fourthly, by moving our portfolio away from a pure business of built-to-print blueprint contract manufacturer towards an added value-oriented built-to-spec-system partner and on-development business. And fifthly: diversification towards designing and manufacturing our own products – perhaps the change having the most potential of them all.”

A valuable partner in the technology offensive was found in the machine tool manufacturer INDEX. Already when Kreisle joined the company, there were five C100 production lathes and a C200 machine, as well as an ABC lathe, in the well-equipped production workshop. Unfortunately, these high-end machines were not fully utilized with the machining of adequate products, so the profit margins were not sufficient to absorb the costs.

A milestone towards the turnaround was a major contract for RO-RA to manufacture so-called connectors in over 200 varieties. These partly 3D-curved pipe flanges are used for the connection of composite media lines with each other as well as to fix the pipes to the aircraft structure. The challenges: from the aluminum sawed blank with up to 30 kg weight and 400 mm diameter, sometimes up to 90 percent had to be cut to chips – in the chuck, mainly by milling, but also by turning, and, as a result of the free shapes, often in five axes simultaneously. >>

“To successfully automate production, the solution is to drive processes for components up to complete mastering.”



Markus Kreisle  
CEO of RO-RA



Connector  
© RO-RA

It soon became clear that a technological upgrade towards high-performance turn-milling and thus towards turn-mill centers from INDEX was inevitable. With two powerful motorized milling spindles in two independent subsystems and a total of 14 NC axes, INDEX R200 and R300 machines are capable of performing five-axis operations simultaneously on both spindles in the sense of complete machining. Especially critical in this project: from the delivery of the two machines – an INDEX R200 INDEX and an INDEX R300 – to the FAI acceptance date for 220 connector variants, there were only five months, just nine months until the start of full production. Until then, RO-RA, supported by INDEX specialists, had to adapt the turn-mill technology and the five-axis NX CAM process chain and to prepare the processes ready for standard production.

The devil was in the details, as Franz Wimmer, the responsible INDEX sales engineer, explains: “The combination of the requirements – a tremendous amount of chips, highly complex and thin-walled parts with exacting tolerances and reference dimensions – took the hardware and software to its limits at entirely unexpected places. But together with the top technologists at RO-RA, our experienced application engineers have mastered the challenge in spite of the short period.”

#### **Building the FutureZone with sustainability projects**

For RO-RA CEO Markus Kreisle, this experience was the crucial spark to establish a platform for concerted process development up to production maturity together with all the technology partners involved – prior and also parallel to the ongoing production: “More than what INDEX and we have achieved until full production of this connector family actually is not possible using a classic approach. So the solution is to develop processes for future components here in our “FutureZone” up to

complete mastering, because only then it is possible to automate production successfully. This kind of process innovation creativity center, equipped with high-end machines of all cutting methods we require – including a G220 turn-mill center and another INDEX ABC automatic lathe – we can not only use to test processes, before they are employed in production, but also for visionary optimization projects, as well as for training our new young professionals at the highest level. We have assigned our best experts to this task, and in view of the already developed potential, this investment pays for itself several times.”

Also INDEX Marketing Head Michael Czudaj is convinced of the benefits of the FutureZone: “Merging application-specific manufacturing experience with promising projects and basic talent work is exceptionally successful. The systematic collection of process know-how will help the machining experts of RO-RA achieve even more speed and efficiency in application design. We are all happy to join in as partners.”

#### **Categorize, standardize and automate**

Flagship projects that RO-RA is working on with selected partners such as INDEX are, for example

- 40% increase in productivity
- 7000 hours of spindle use per year
- Running in components without setup engineers
- Economic batch size 1

In addition, for example, the highly flexible G220 turn-mill center with bar feeder, five-axis motorized milling spindle, and tool turret with Y-axis has been used in the FutureZone to drive another series of new, highly customized RO-RA in-house products: the “struts”.

Markus Kreisle: “Struts are rods for the structure and interior of the aircraft with different functions. In the interior, they are used to hold various elements,

including the cabin within the fuselage. For the structure, struts are used for safety-relevant control tasks, such as for setting the flap position, or adjusting the rotor blade pitch in helicopters. Because these struts can be shaped very specifically, we provide our customers an ingenious product configurator for the selection of length, diameter, material, and end geometry (rod ends with round ball joints and fork ends with fork-shaped connection). In this way, we produce 30,000 struts today, in three years up to 200,000 struts. After completing the optimization phase of the processes on the G220, these varied parts today run properly and economically on our INDEX C100 and

C200 lathes in small batches down to lot size 1."

The FutureZone is for Kreisler the breeding ground for further change activities of the future: "We are a bottleneck-driven company. To be able to serve our customers with even greater flexibility and anticipate their wishes in the future, we strive for categorization of all products and standardization and automation of all manufacturing processes. For this, we are looking for partners in the market for meaningful interaction in a value-added context, such as building hybrid capacities that are shared with suppliers with comparable competence

based on categorized products. From our point of view, this is the most reasonable interpretation of industrial digitalization, in addition to other aspects such as tool management. Typically, there are no ready-made solutions, but an accumulation of interface problems. Those, too, we want to solve in the FutureZone. Jointly with our most important value creation partners, which from now on includes INDEX. After all, machining is and will remain our no-me-too core business."



1



3

1 "Indexville": RO-RA CEO Markus Kreisler's statement about parts of the company's manufacturing testifies to the importance of the machines and the expertise of the Esslingen partners, five C100 lathes in a row, for the production of struts among other parts. © Hanser



4

2-4 High-end products for aviation, produced at RO-RA on INDEX machines: strut variants (2), engine part made of high-tempered steel (3), as well as engine component with partial assembly (4) © RO-RA



5

5 Productivity guarantor: efficient complete machining of safety-relevant connectors on the INDEX R200 turn-mill center. © Hanser



2

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Eight spindles for efficient production

# MAXIMUM PRODUCTIVITY

The new multi-spindle automatic lathe INDEX MS40-8 is characterized by its outstanding versatility. With eight motorized spindles, simple and complex bar and chuck parts can be machined in the shortest cycle times.

## 8 fluid-cooled motorized spindles

- > 40 mm spindle clearance
- > 7,000 rpm max. speed
- > 24 kW max. output
- > 57 Nm max. torque





To extend the machining range of the six-spindle MS40C, INDEX has developed an eight-spindle version for bar stock machining up to 40 mm. This is the INDEX MS40-8, which can be individually configured with up to 18 CNC slides (X/Z), additional Y-axes, and synchronized spindles for rear end machining and numerous other options. Chuck parts can be machined up to a blank diameter of 80 mm on this multi-spindle automatic lathe.

A large number of stationary and live tools are available for front and rear-end machining. The front-open machine concept – without longitudinal slide block – and the V-shaped arrangement of the tool carriers on the work spindles ensure that the optimum technological sequence alone determines the machining method. Thus, for example, external and internal machining operations using stationary or live tools can be carried out in every station.

The generously dimensioned work area can be accessed through two sliding doors on the side. This is not only convenient for the user but also reduces setup time appreciably. An advantageous slide arrangement also ensures unhindered chip flow and, thus, a high level of process reliability.

### Highly complex or highly productive

The heart of the INDEX MS40-8 multi-spindle automatic lathe is the compact spindle drum with eight fluid-cooled motorized spindles with synchronized technology (max 7.000 rpm, 24 kW, 57 Nm). They are characterized by infinitely variable speed control, high torque, low size and no maintenance requirements. The MS40-8 is able to machine even very complex parts in one operation. And, there are up to two pivoting synchronized spindles, each able to work on up to seven rear end machining tools: four of them can be live. A new feature is that two rear end machining tools can work simultaneously on the workpiece.

However, the outstanding feature of the MS40-8 is its economic versatility. If components need to be cut with only a small number of tools, it can be used as a highly productive double four-spindle machine. This possibility is already “built in” in the standard version. If the user makes this choice, he has practically two four-spindle machines available of which each provides a synchronized spindle for rear end machining. Each cycle finally outputs two finish-machined components from the machine, which cuts the cycle time in half.



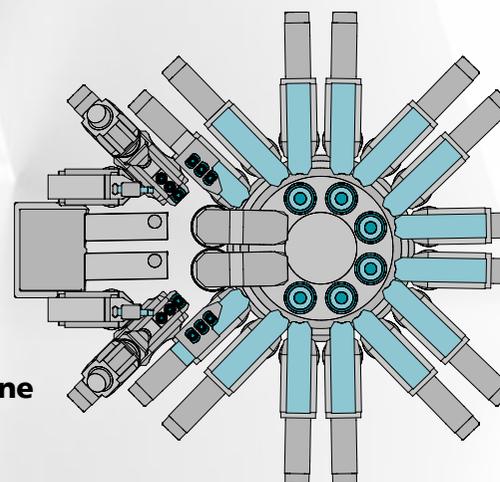
### iXpanel - i4.0 ready

- > 18.5" touchscreen
- > Based on: Siemens S840D sl
- > Industry 4.0 features

More details:  
[index-traub.com/ixpanel](http://index-traub.com/ixpanel)

### Configured as double four-spindle machine

Additional cycle time reduction by simultaneous production of 2 workpieces





**Mounting**

D38 x 70 mm / 16MnCr5

**Drive shaft & drive pinion**

D20 x 115 mm / X8CrNiS18-9  
 D28 x 60 mm / 11SMnPb30

**Valve screw**

D32 x 85 mm / 42CrMo4

**Valve sleeve**

D35 x 70 mm / 42CrMo4

**Optimized rear end machining**

But the INDEX MS40-8 offers still more opportunities to improve productivity: it can also be used as a machine with six main-end and two rear-end machining stations. This is especially interesting for components that require costly rear-end machining.

Because then – when using only one synchronized spindle – this may take longer than the cycle time of the main spindles. So the cycle would have to be extended accordingly or the part would need to be transferred to another machine for reworking. On the MS40-8, the user can use the second synchronized spindle to machine another part from the rear end in parallel. This finishes two parts simultaneously, and the rear end machining time is cut in half.

**Optimum cutting data**

The well-known advantages of the INDEX CNC multi-spindle machines, such as the use of hollow-shaft motor technology in all work spindles and the possibility to select the optimum cutting data via the CNC program, were of course also carried over to the MS40-8. Always the optimum speed can be programmed during machining for each spindle position and cutting tool edge. The results are optimum chipping, maximum surface quality, short production times per piece, and extended tool life. Thus, you can also machine troublesome materials that up to now were hardly suitable for multi-spindle machines. Speed changes are possible also during drum indexing. The C-axes available in all spindle positions also permit complete machining of intricate workpieces in minimum time.

The optionally available Y-axes expand the range of machinable workpieces even more. Many machining technologies can be integrated with the MS40-8: off-center drilling, thread cutting, inclined drilling, cross drilling, contour milling, hobbing, bevel gear cutting, and multi-edge turning are only a few of the many possibilities.

**Directional parts removal**

The INDEX MS40-8 is equally suitable for the machining of bar stock and chuck parts. As bar loader, INDEX's own, newly developed bar loading magazine INDEX MBL40-8 is available among others.

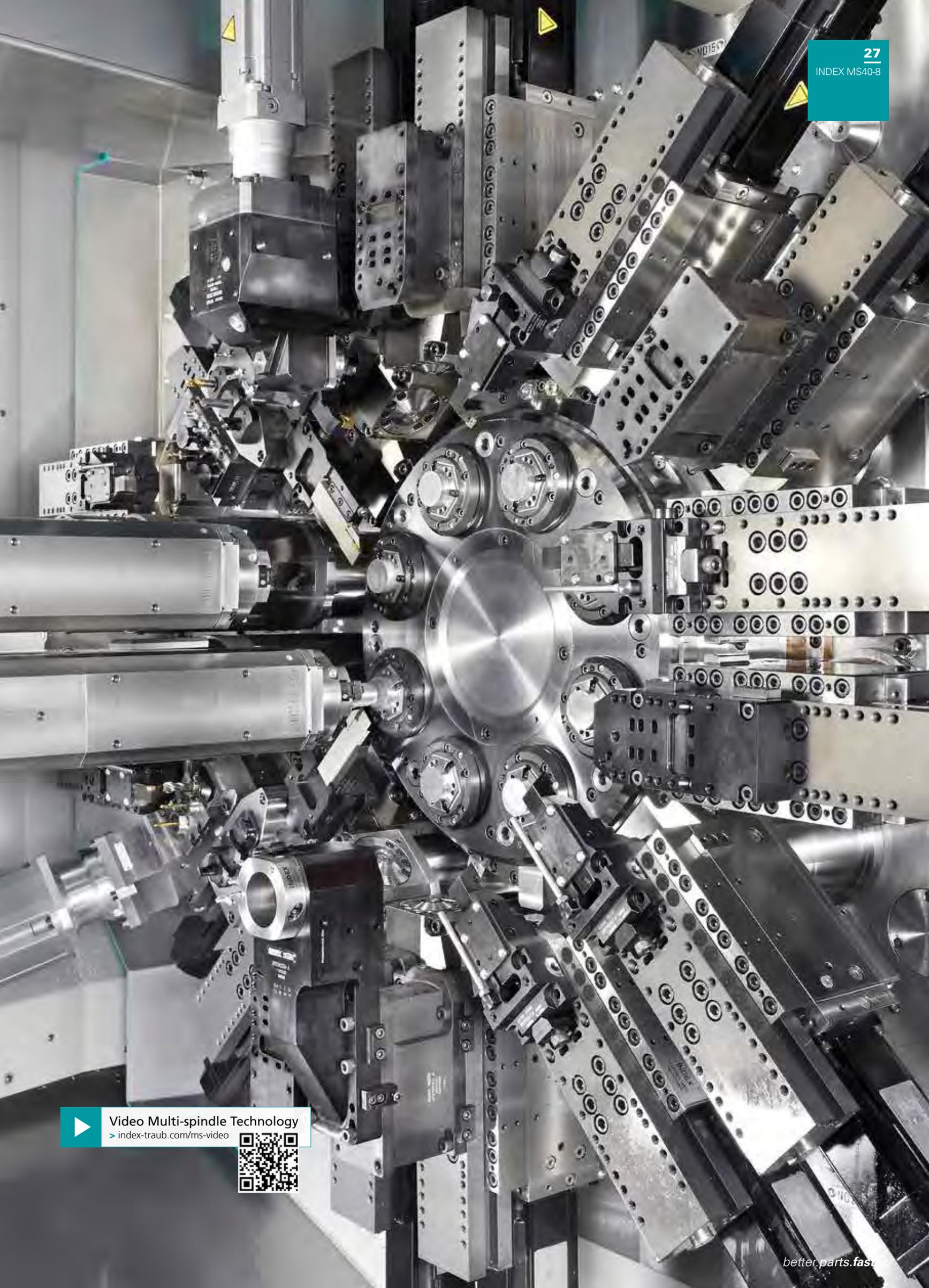
The perfect complement to the MS40-8: the new bar loader MBL40-8



To machine chuck parts, the MS40-8 is the ideal choice for automatic loading thanks to its generous work area without an annoying longitudinal slide block. The optional built-in robot with double gripper in the work area handles the loading and unloading of workpieces. The chuck diameter of 110 mm allows machining of pre-formed, forged or extruded parts of up to 80 mm.

**Technical data of MS40-8**

<b>Work spindles</b>	8
Max. bar length	40 mm
Speed	7,000 rpm
Max. output	24 kW
Max torque	57 Nm
<b>Max. tool carriers</b>	16
Slide travel X	85 mm
Slide travel Z	120 mm
<b>Synchronized spindles</b>	1 / 2
Max. speed	8,000 rpm
Max. output	14 kW
Max torque	22 Nm
Slide travel Z	150 mm
Number of tools for rear end machining	7 / 14
<b>Dimensions</b>	
L x W x H in mm	4010 x 2142 x 3216



▶ Video Multi-spindle Technology  
> [index-traub.com/ms-video](https://index-traub.com/ms-video)



# PROFESSIONAL OVERHAULING

Fundamentally overhauled and upgraded with the latest control technology, the productivity of proven INDEX and TRAUB machines can be increased by up to 30 percent or more. Specifically for this service, the INDEX Group has now established the "Refit" division.

Several thousand INDEX and TRAUB machines are used reliably in production worldwide thanks to their quality and durability – even after decades. However, productivity and precision decline after long use due to wear. Then the question is: new purchase or professional overhaul of the machines?

Several sound arguments speak for a machine overhaul: the existing resources and programs can be reused. This saves additional investments. Productivity and part quality remain ensured, the production process need not be changed. And the costs are manageable.

With the new Refit division, the INDEX Group now offers a machine overhaul directly from the manufacturer. "We know the history of the machines and have the original parts, drawings and documentation," says Dr. Roland Lederer, head of the new organizational unit. We thus have a strong organizational unit for the overhaul

of INDEX and TRAUB machines – from the technical know-how to the supply of spare parts. In particular, for those partly customer-specific setups and applications we have all the information. "We can therefore ensure short turn-around times," says Lederer. That can be very fast if, for example, an old machine is replaced with an identical overhauled model that is currently available. This allows especially short and predictable downtime.

For a professional refit, the machine and assemblies are typically completely dismantled, cleaned, and re-painted as needed. The interior gets a "makeover" treatment. Wear parts, guide elements, fluid lines, sensors and cables in the machine area are replaced, working and milling spindles are overhauled in proven manufacturer quality, and the control system is upgraded to the state of the art. Benefits to the customer: Increased productivity through a more effi-

cient control system. The saving of machining time per piece may be up to 30 percent or more.

INDEX offers the refit at a fixed price including a 12-month warranty. Service hotline and spare parts are fully available. As only original INDEX-TRAUB spare parts and software are used, retrofits are possible at any time. The INDEX Group sets high quality requirements for a refit comparable with those for the production of a new machine. The sale of refitted INDEX and TRAUB second-hand machines is being expanded as well.

With our refitting service, we offer our customers modernization tailored to their machine – a profitable investment that maintains the value of the machines and increases productivity.



## Refit – your benefits:



**Increase in  
productivity &  
quality**



**Value preservation  
of the machine**



**12 months  
warranty**



**Fixed price  
offers**



The following services can be performed:

- Cleaning and repainting of the machine
- Replacement of all mechanical wear parts, such as filters, belts, linear guides, ball screws
- Replacement of cables, cable drags and electrical wear parts
- Overhaul of motors
- Replacement of hydraulic components, such as valves, hydraulic hoses, lubrication lines
- Overhaul and new bearings of spindles
- Replacement of clamping cylinders
- Software or control update to the latest version
- Commissioning with geometry check
- Optionally: pick-up and delivery of the machine

Before:



After:



### CONTACT

#### Refit experts

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# NEWS TICKER

## New managing director in the US

Since January 2017, Tom Clark has taken over the management of INDEX Corporation in Noblesville, Indiana. He joins INDEX with the experience of a long career at a renowned manufacturer of machining centers. As vice president, Mr. Clark held numerous positions in sales, sales management, engineering, customer service, and as managing director of a global aerospace division. He started his career with a degree in mechanical engineering from Purdue University in Indiana. Under the direction of Tom Clark, the INDEX Corporation will be pursuing the goal in the coming years to significantly increase sales in the US and Canada. First initiatives to increase the efficiency of the sales force are already showing success. Another focus is on strengthening the technical support of customers and the expansion of the automation competence.



>> [us.index-traub.com](http://us.index-traub.com)

## New distributor in Mexico



Since January of this year we have appointed the distribution in Mexico to our new partner MAQUITEC. MAQUITEC has decades of experience in sales and service.

The focus has always been on high-quality European machine tools. MAQUITEC's head office is located in Mexico City. In addition, it operates several sales and service centers throughout the country. The goal of the future co-operation with MAQUITEC is the rapid identification of customer needs, to provide our customers the best solution for their manufacturing challenges. One of the important target industries will be the automotive supply industry.

The combination of customer proximity and high technical competence, as is provided by MAQUITEC,

represents a significant success factor for the expansion of our business in the important Mexican market.

>> [www.maquitech.com.mx](http://www.maquitech.com.mx)

## TRADE SHOWS & EVENTS

### EMO // GER

September 18 - 23, 2017, Hanover

### CMTS // CAN

September 25 - 28, 2017, Ontario

### MAKTEK // TUR

October 4 - 7, 2017, Istanbul

### MSV // CZE

October 9 - 13, 2017, Brno

### SOUTHTEC // USA

October 24 - 26, 2017, Greenville

### NORTEC // GER

January 23 - 26, 2018, Hamburg

### SIMODEC // FRA

March 6 - 9, 2018, LaRoche

Additional trade show dates can be found on the Internet at:

[www.index-traub.com](http://www.index-traub.com)

## Gold medal for the multi-spindle machine MS16 Plus

At the Machtool trade fair in Poznań, Poland, the multi-spindle automatic lathe INDEX MS16 Plus was honored with the Złoty Gold Award. The prize honors innovative and productive technologies and was presented to the INDEX sales team during a public ceremony.

>> [index-traub.com/ms16plus](http://index-traub.com/ms16plus)



The INDEX sales team in Poland (from right to left): Gerald Kauderer, Norbert Hartwich, and Eberhard Stadel at the award ceremony

## LEGAL NOTICE

**TURNINGpoint 04.2017**  
September 2017

**Publisher**  
INDEX-Werke GmbH & Co. KG Hahn & Tessky  
Ploching Str. 92  
73730 Esslingen  
Phone: +49 (0) 711 3191-0  
[www.index-werke.de](http://www.index-werke.de)

**Responsible for the contents**  
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**Editorial support**  
k+k-PR GmbH, Augsburg  
Helmut Damm, Carl Hanser Publishing House

**Printing**  
WAHL-DRUCK GmbH, Aalen

**Photos**  
INDEX-Werke GmbH & Co. KG Hahn & Tessky  
iStockphoto.com:  
S.05 - FredFroese / S.17 - PhonlamaiPhoto  
S.19 - dell640 / S.25 - eugenesergeev  
S.29 - pixhook / S.32 - rawpixel

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**INDEX**  
**TRAUB**

# **OPEN** **HOUSE** **BILBO** **RA**

▶ APRIL, 24 - 27



## **SAVE THE DATE !**

Please mark your calendar for this week.  
We look forward to your visit!

▶ Review: video & photos of Open House 2017:  
**[index-traub.com/openhouse](http://index-traub.com/openhouse)**

*better.parts.faster.*

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