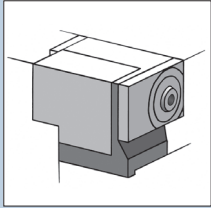


# KELLENBERGER 100

THE UNIVERSAL PLATFORM  
FOR CYLINDRICAL GRINDING

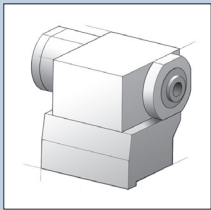


# KELLENBERGER 100



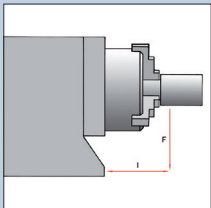
## UNIVERSAL WORKHEAD

- Applications with fixed or rotating spindle
- n 1-1'000 min-1
- Roundness accuracy  $\leq 0.4 \mu\text{m}$  (optionally  $\leq 0.2 \mu\text{m}$ )
- Fine angle adjustment with correction range 1.5'



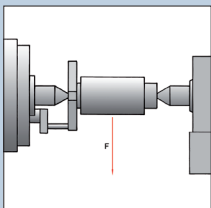
## WORKHEAD WITH DIRECT DRIVE AND C AXIS

- For high-precision non-circular grinding
- n 1-1'000 min-1
- Roundness accuracy  $\leq 0.4 \mu\text{m}$
- Base with fine angle adjustment with correcting range 1.5'



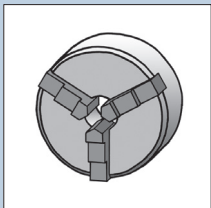
## LOAD WITH CHUCKED WORK

- 100 Nm (max 100 kg)
- 200 Nm with direct drive (max 150 kg)



## LOAD BETWEEN CENTERS

- 100 kg
- 150 kg with direct drive



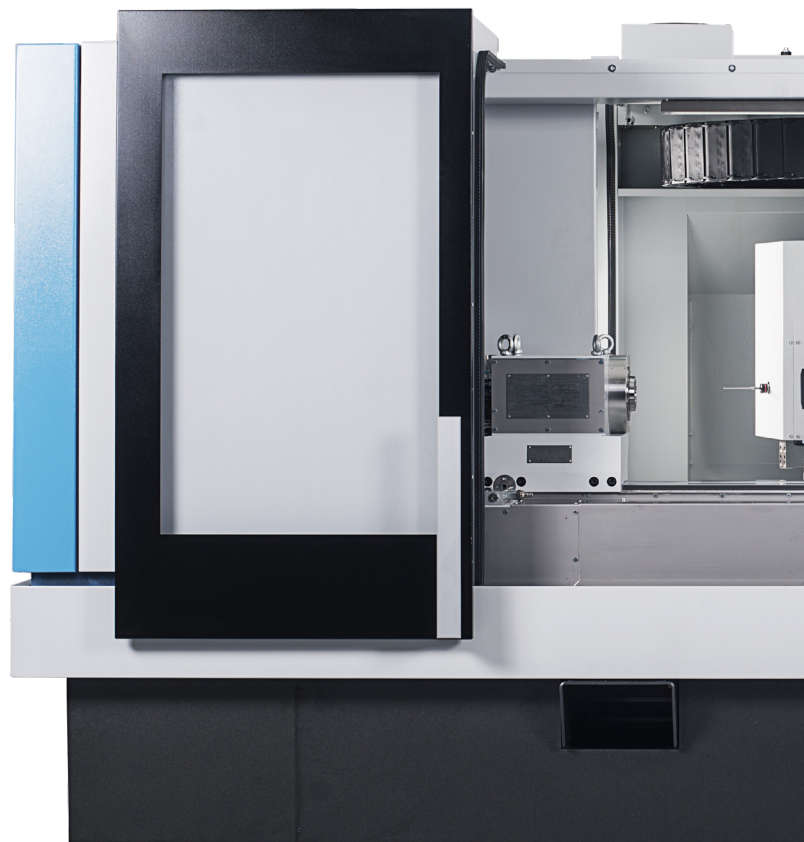
## POWER CLAMPING SYSTEM

- Clamping force 2'000–9'000 N
- Power-actuated chuck
- Spring collets



## TRANSPORT

- Efficient commissioning due to different lifting options



## CNC-CONTROL SYSTEM FANUC 31i-B

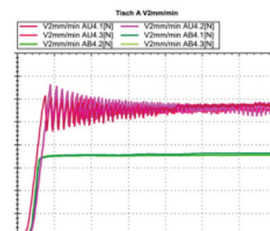
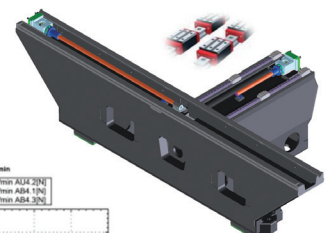
- 19" LCD color monitor with touch operation, height-adjustable
- BLUE Solution teach-programming with OBJECT Guide for guided and easy creation of programs on the workpiece
- IPC Windows Embedded Standard 7 operating system
- Hand-held panel with axis & speed selector
- Ethernet (RJ45) and USB 2.0 connections

## TABLE / SLIDE

- Linear guide for X axis, low maintenance, high precision, proven a 1'000 times over
- Low-wear slide guide for Z-axis with special anti-stick-slip coating, for high-precision machining of contours
- Glass measuring devices on X- and Z- axes
- High dynamics due to speeds of up to 20 m/min. in Z- and 10 m/min. in X-axis

## BASIS

- FEM-optimized cast machine bed for high stability and longevity
- Mechanical separation of machine and peripherals, for thermal stability and prevention of vibrations





# THE NEW DEFINITION OF A CNC CYLINDRICAL GRINDING MACHINE



## ERGONOMICS

- Advanced optical and ergonomic design
- Good overview of the grinding process
- Interfaces for table assemblies arranged centrally and for ideal access
- Swiveling and height-adjustable control panel for optimized operating convenience
- Cleverly designed accessibility for low-cost maintenance and service

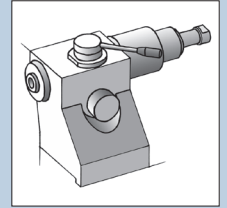
## AUTOMATION

- PROFIBUS interface and prepared mechanical infrastructure
- Synchronous tailstock for complete machining of shafts
- Loading cell with highly autonomous operation and quick setup times
- Project-specific solutions can be realized by request



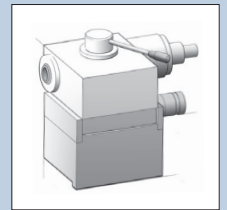
## TAILSTOCK 100

- Up to 100 kg workpiece weight
- Morse taper 4
- Retraction of sleeve 49 mm
- Adjustment range  $\pm 30 \mu\text{m}$
- Pneumatic lifting



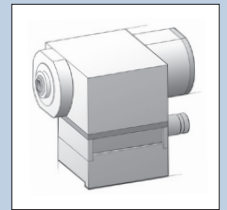
## TAILSTOCK 150

- Up to 150 kg workpiece weight
- Morse taper 4
- Retraction of sleeve 49 mm
- Adjustment range  $\pm 75 \mu\text{m}$
- Pneumatic lifting



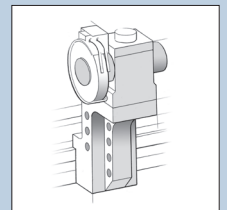
## SYNCHRONIZED TAILSTOCK

- Machining of shaft parts without driver
- Sleeve with MT4 and 49 mm retraction
- Adjustment range  $\pm 75 \mu\text{m}$
- Automatic cylinder correction (optional)



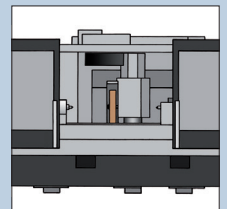
## HF DRESSING DEVICE

- For rotating dressing tools
- Behind table assemblies
- On the table

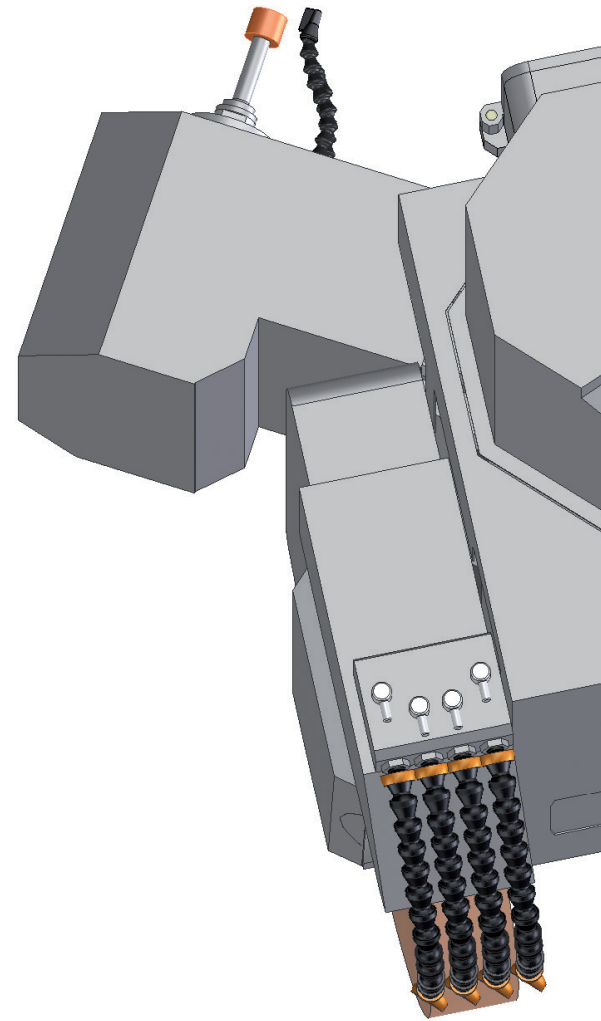
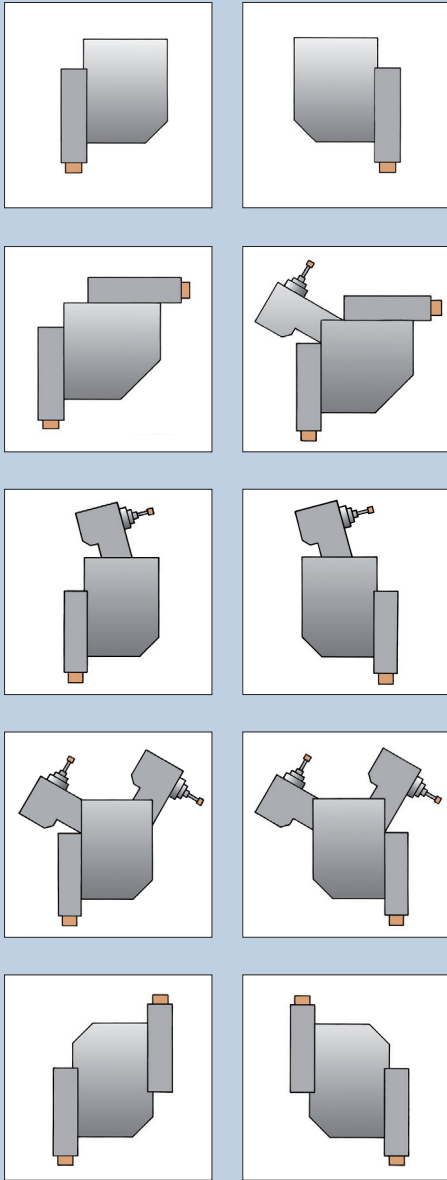


## AUTOMATED SLIDING DOORS

- Relief for the operator
- Faster workpiece changeover times



# MODULAR WHEELHEAD SYSTEMS — COMPACT AND INNOVATIVE



## WHEELHEAD

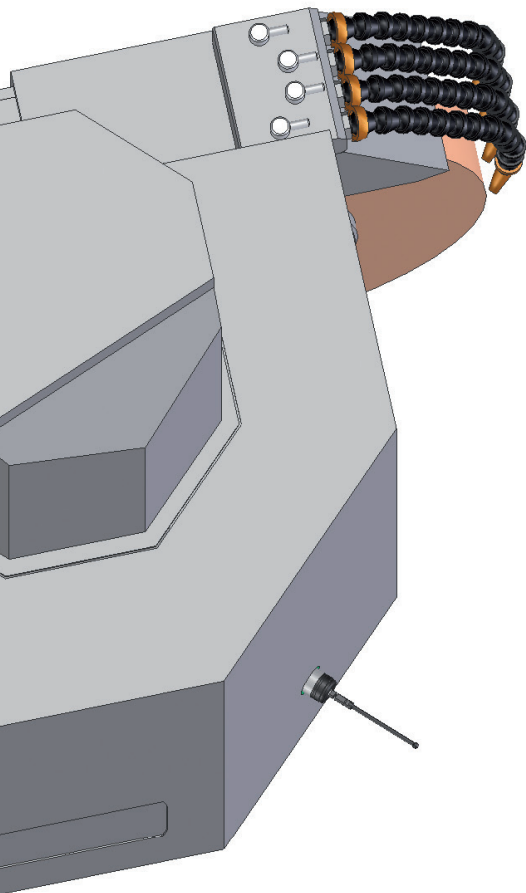
The ingenious concept of the modular wheelhead allows 10 different wheelhead variants with up to 3 tool positions and one measuring head position. Each individual position is arranged in such a way that a maximum in collision-free operation is guaranteed. Combined with large axis paths, an optimum in flexibility is achieved in the machining of workpieces of different sizes.

- External grinding with water-cooled motor spindles and 11.5 kW power
- Special oil lubrication guarantees long service life
- Grinding wheel dimensions up to  $\varnothing 500 \times 100$  mm
- High-frequency internal grinding spindles, available as grease-lubricated or oil-air-lubricated models
- 150 mm mounting bore allows internal grinding spindles with large radial rigidity





# INTERNAL GRINDING / SWIVEL DEVICES / ACCESSORIES



## SWIVEL DEVICES

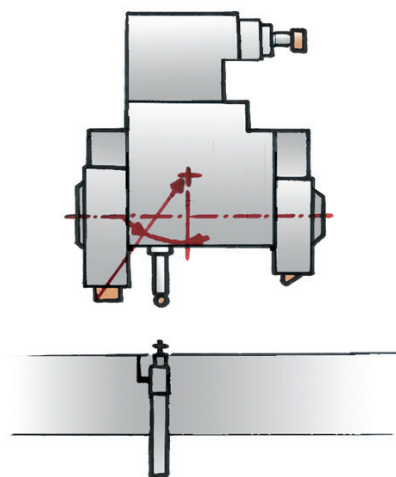
Two versions are available for positioning the wheelhead (tool change time approx. 5s):

- 1° indexing with automatic drive or
- B-axis with direct drive with resolution of 0.00001° and a repeatability of <0.5" incl. KEL-SET (patented grinding wheel measurement)

## ACCESSORIES

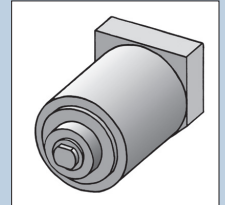
- Tactile measuring head, fastened rigidly on wheelhead, for active measuring tasks
- Integrated lifting system for grinding wheel changeover and for lifting table assemblies; saves having a crane at the machine
- Various steady-rests, also including guiding steady-rests for grinding

## KEL-SET



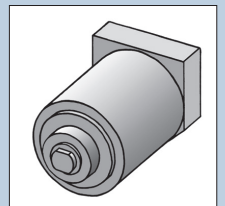
## INTERNAL GRINDING ATTACHMENT

- Grease-lubricated HF internal grinding spindle 6'000 - 40'000 min<sup>-1</sup> 10'000 - 60'000 min<sup>-1</sup>
- Inexpensive and compact



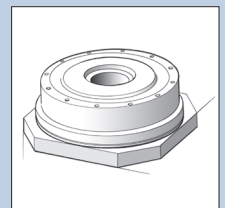
## INTERNAL GRINDING ATTACHMENT

- Oil-air lubricated HF internal grinding spindle 4'500 - 45'000 min<sup>-1</sup> 8'000 - 60'000 min<sup>-1</sup> 12'000 - 90'000 min<sup>-1</sup>
- Powerful and universal



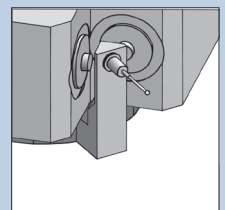
## SWIVEL DEVICES

- Automatic indexing 1°
- B axis with direct drive (optional)
- Quick tool changeover time and high-precision positioning



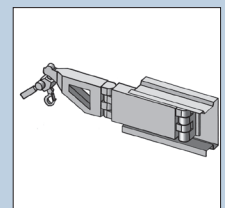
## TACTILE MEASURING HEAD

- Active measurement on external machining
- Orientation of the workpiece position in Z- and C-position
- Mounted on wheelhead



## INTEGRATED LIFTING SYSTEM

- Ergonomic lifting system for table assemblies and grinding wheels



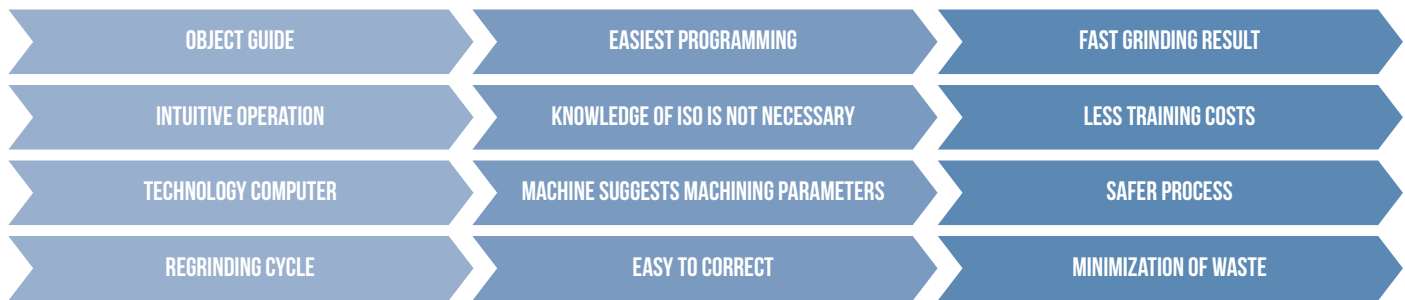
# FANUC CONTROL SYSTEM 31i-B WITH KELLENBERGER HMI

The BLUE Solution user interface from KELLENBERGER has the central focus on simple and intuitive operation. All interactions are carried out by gestures on the 19" touch display. The latest generation of a reliable FANUC 31i-B control runs in the background.

## BLUE SOLUTION



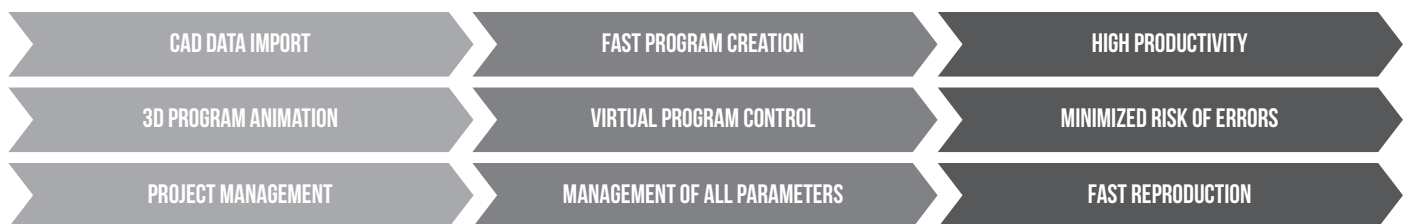
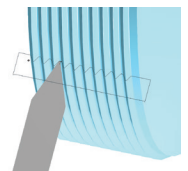
The user interface was developed explicitly for grinding by our specialists in cooperation with customers. BLUE Solution supports users regardless of their level of experience in all important steps from setup to production.



## BLACK CAM SOLUTION

With the additional BLACK CAM Solution software, NC programs for grinding and dressing of profiles and threads can be generated, simulated and analyzed.

The CAD-CAM software supports the structured creation, processing and management of all documents belonging to a workpiece.



## INDUSTRY 4.0

The Security Interface ensures communication according to the highest IT security standard between the machine and the production network.

The optional Remote Diagnostic module simplifies efficient diagnosis in case of service and thus reduces downtimes.

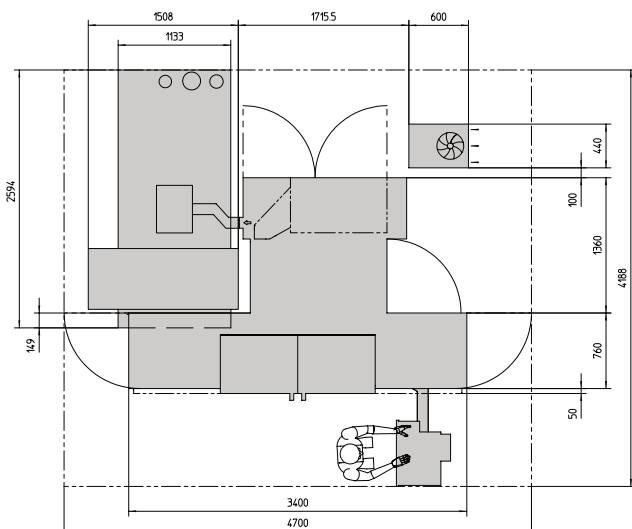
The machine is prepared for Industry 4.0. With the ComGateway, which has a standard OPC-UA server, extensive information on process and machine status can be exchanged.



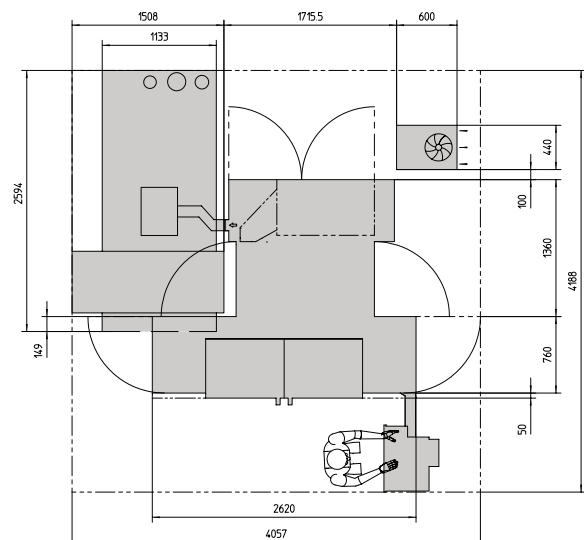
| Main Specifications                |       |                           |
|------------------------------------|-------|---------------------------|
| Distance Between Centers           | mm    | 600/1,000                 |
| Center High                        | mm    | 200                       |
| Loading capacity, between centres: | kg    | 100 / 150                 |
| Spindle loading capacity, chucked: | Nm    | 100 / 200                 |
| Mains Voltage Required             | V     | 400 / 460                 |
| Power Consumption                  | A     | 35-63                     |
| Space Required / length x width    | m     | 2620 x 2170 / 3400 x 2170 |
| Total Weight                       | kg    | 3,600 /4,000              |
| Longitudinal / Slide Z-Axis        |       |                           |
| Travel                             | mm    | 750 mm / 1150 mm          |
| Rapid Traverse Speed               | m/min | 20 m/min                  |
| Resolution                         | mm    | 0.00001                   |
| Wheelside X-Axis                   |       |                           |
| Travel                             | mm    | 365                       |
| Rapid Transverse Speed             | m/min | 10 m/min                  |
| Resolution                         | mm    | 0.00001                   |
| B-Axis                             |       |                           |
| Swiveling Range                    | Grad  | 280°                      |
| Swiveling Time                     | Sec   | 1                         |
| Automatic Indexing                 | Grad  | 1                         |
| System Resolution                  | Grad  | 0.00001°                  |
| Wheelhead                          |       |                           |
| Water-Cooled Motor Spindle         | KW    | 11.5                      |
| Peripheral Grinding Wheel Speed    | m/s   | 50 / 63 (option)          |
| Grinding Wheel Dimensions          | mm    | Ø500                      |
| Internal Grinding Attachment       |       |                           |
| Bore for Spindle                   | mm    | 150                       |
| Power, HF 51 Spindles              | KW    | 4.2 - 15                  |
| Rotation Speed                     | min-l | 4,500 - 90,000            |
| Workhead                           |       |                           |
| System Resolution C-Axis           | Grad  | 0.00001                   |
| Rotation Spindle Speed             | min-l | 1 - 1,000                 |
| Drive Torque                       | Nm    | bis 63                    |
| Interface                          |       | ISO 702-1, Gr .5/MK5      |
| Roundness Accuracy in Chucked Work | µm    | optional 0.2              |
| Tailstock                          |       |                           |
| Internal Taper                     |       | MK4                       |
| Retraction of Sleeve               | mm    | 49                        |
| Option micro-adjustment            | µm    | +/- 30 and +/- 75         |

All specifications and designs are subject to alterations without notice

## SETUP PLAN 600

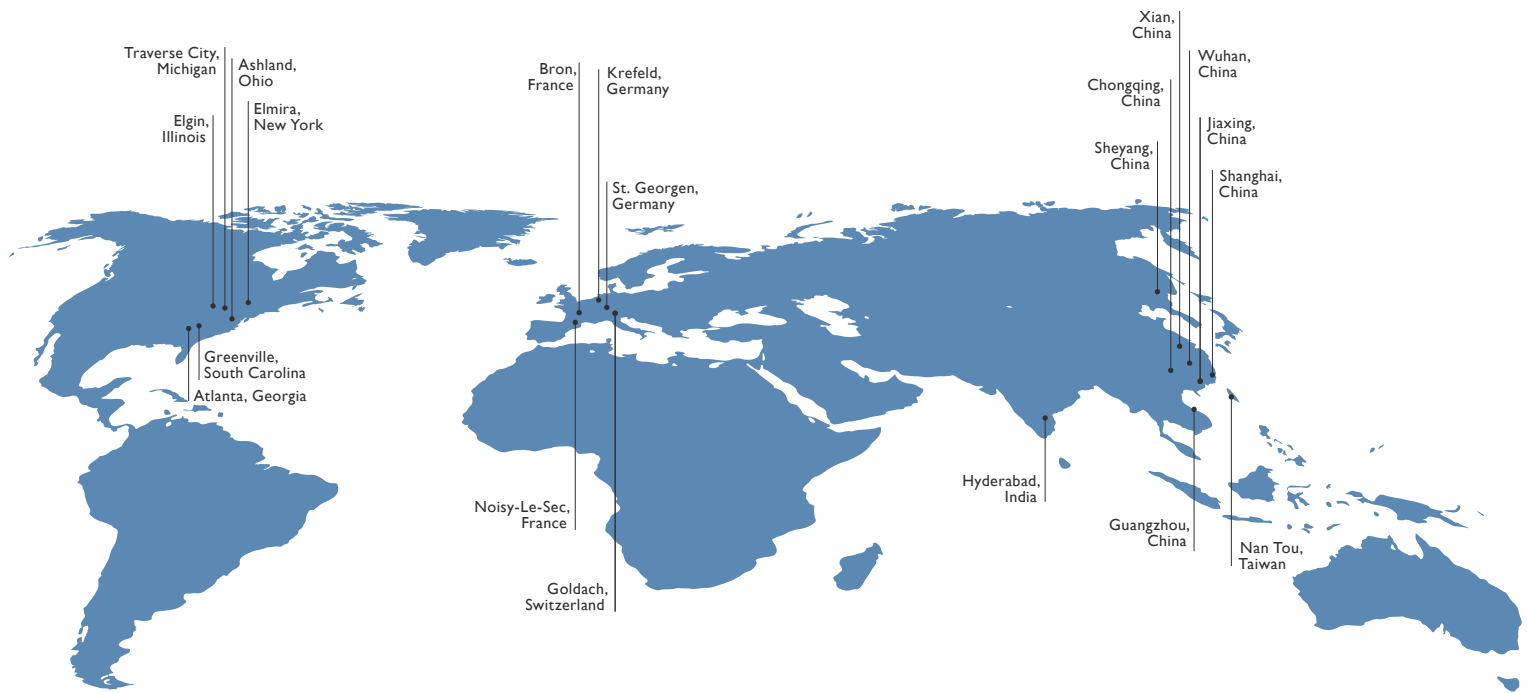


## SETUP PLAN 1000





# HARDINGE WORLDWIDE



Hardinge is a leading international provider of advanced metal-cutting solutions. We provide a full spectrum of highly reliable CNC turning, milling, grinding, and honing machines as well as technologically advanced workholding accessories.

The diverse products we offer enable us to support a variety of market applications in industries including aerospace, agricultural, automotive, construction, consumer products, defense, energy, medical, technology, transportation and more.

We've developed a strong global presence with manufacturing operations in North America, Europe, and Asia. Hardinge applies its engineering and applications expertise to provide your company with the right machine tool solution and support every time.

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