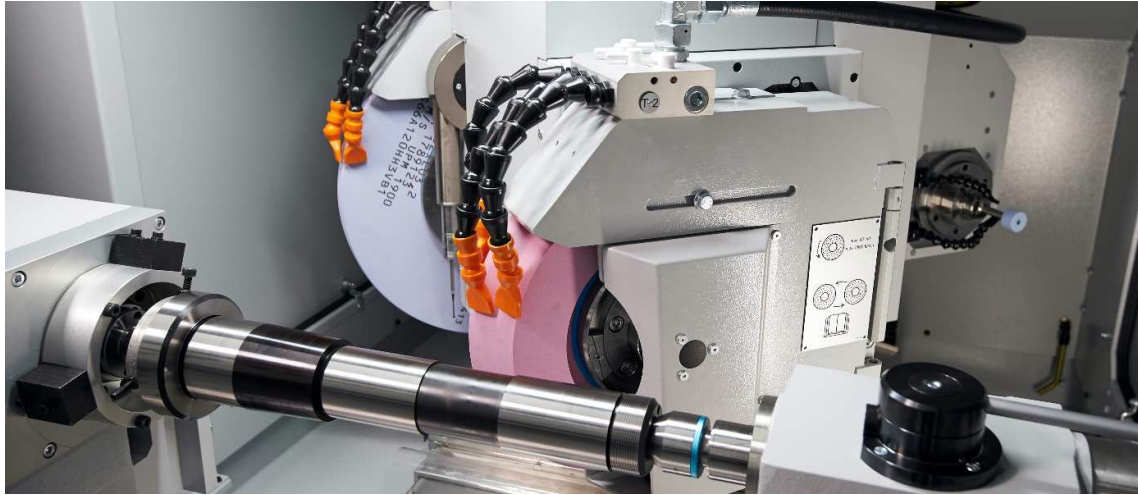


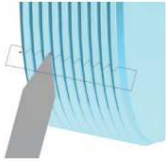
KELLENBERGER



Hardinge – KELLENBERGER® 10 Demo Q&A

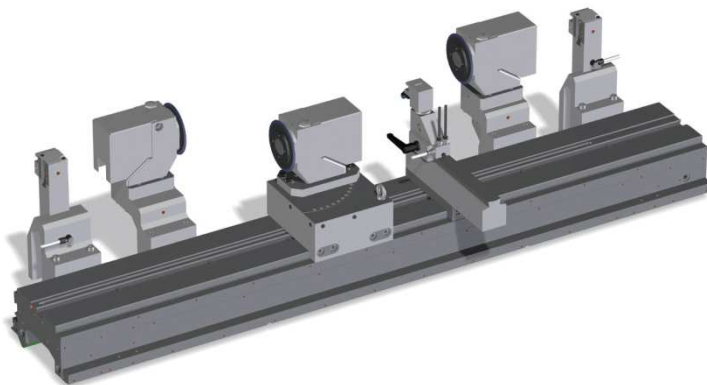
Q: Could you please explain thread grinding on this machine? Which kind of threads can we grind on cylindrical grinders?

A: All standard threads like metric and UN threads can be ground. Special threads with very steep flank angles or large pitches need to be reviewed.



Q: Can you review the various dressing options?

A: Thanks to the KELLENBERGER standard table interface over the whole length there are dressers at the back side of workhead and tailstock. Several further dresser positions / devices are available.



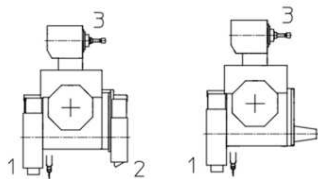
Q: Can you please highlight the main differences between the Kellenberger 100 and 10? And what are the similarities (how are they related)?

A: The K10 is cost and lead time optimized. It is a stripped down K100. From the technical point of view, the limitations of the K10 are:

- Fanuc 0i instead of Fanuc 31i
- No out of round grinding
- No automation / handling system
- No infinitely variable B-axis
- No specialty constructions
- Less optional features available

Q: Is there a diagonal grinding head for the machine?

A: No, wheel heads UR 1-2-3 and UR 1-3 (see picture below) are available.



Q: How easy is it to train new operators on the software?

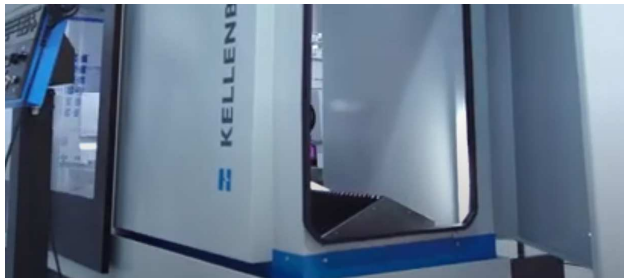
A: A one-day introduction should be enough to operate the machine with BLUE Solution. Within the next few weeks we will provide a video to show its handling.

Q: Is it possible to still use the g-codes for the experienced grinders who are used to use this kind of programming?

A: The BLUE Solution has an Object guide to generate the program. Nevertheless, we're working on features which allow to insert G-coded program lines.

Q: What is the covering on the table, on the ends of the upper table? On the vista there are billows of a rubber type material covering these areas. Are they a steel material?

A: There will also be bellows to cover the linear guideways.



Q: What is the current delivery time?

A: 3 – 4 months

Q: As a universal grinder amongst high class machines, with which models (competitor machines) can we compare this machine?

A: Typical competitors are the Studer Favorit or S33,

Q: Are only HF internal grinding spindles available for this machine, or are belt driven internal grinding spindles also available?

A: Because of performance and safety reasons there are just high frequency grinding spindles available. No belt driven spindles for internal grinding.

Q: In terms of accuracy, can we achieve the same results as with the K0100?

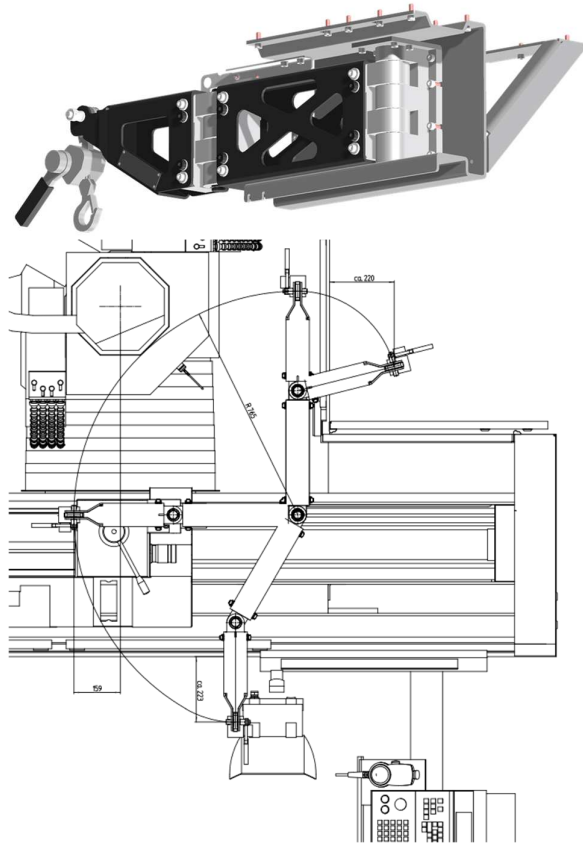
To answer this question, we would first have to define our understanding of accuracy. When A: we are talking about roundness or surface quality then the answer would be yes. When we are talking about contours or absolute measures the answer is no.

Q: Are the OD grinding wheels belt drive or direct drive?

A: A motor with help of belts, pulleys and a tensioning pulley drives the external grinding spindle. No direct drive available.

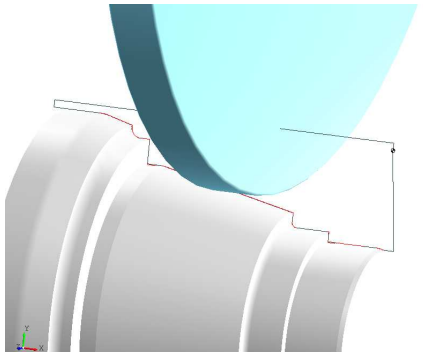
Q: For the service application of wheel head, it says there is a leverage system or an apparatus that you can move it up easily. Could you please demonstrate or explain this one?

A: The optional integrated lifting system allows simple tool change, handling of heavy workpieces and equipment up to 200 kg. further it simplifies maintenance.



Q: Could this machine produce internal splines?

A: The answer is “basically, yes,” but we may need to specify this in detail. A spline can be interpreted as a free contour; it means the grinding wheel does grind a contour profile onto the workpiece. Internal or external does not differ, other than space requirements on the internal grind would need to be reviewed. Please see the below picture, extract from the Black-Cam program, where the wheel is show in blue, workpiece in grey. There we contour grind a profile onto the workpiece. This is possible. This was our understanding during the online presentation.

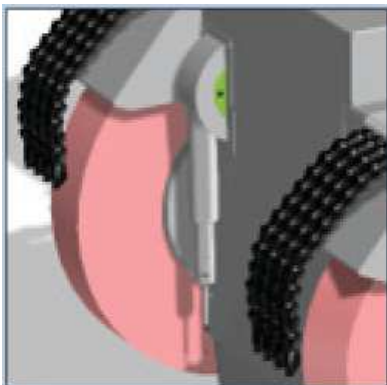


On the other hand, a spline can also be understood as grooves along a shaft. Please see the picture below. Such a spline, internal or external cannot manufactured on the Kellenberger 10. If this was the understanding, then we must apologize.



Q: Can you cover the probing capabilities of the machine? Will it be similar to the Kel-Vista probe?

A: Yes, the probe is similar to the VISTA with a small surplus of accuracy.



Q: Is it possible to grind a taper while product is straight between the centers, for example with a dressed angle on the wheel?

A: Yes. If the taper has an uneven angle there is an interpolation of the X- and Z-axes for the dressing required.

**Q: Is this machine the successor of Vista?
or is Vista still available?**

A: The K0010 is the successor. After successful 20 years the last VISTA has just been discontinued.

Q: Is an interface for automation feasible?

A: No.

Q: Is the grinding wheel speed variable?

A: Yes, the speed is continuously programmable with a maximum speed of 50 m/s.

Q: At which position exactly is the connection of the suction system?

A:



Q: Is ready for industry 4.0?

A: Yes

Q: How does the price level in % compare to K100 and availability?

A: This depends strongly to the specification. 25% is realistic.

Q: What is the B axis swivel time from T1 to T3? Is it faster than Vista, or the same as K100?

A: Yes, it is slightly faster, approx. 10s.

Q: What type of automatic drivers are available from Hardinge?

A: Everything that is implementable to the ISO 702-I size 5 or MT5 interface and does not need any software integration.

Q: Can we simulate the spline profile before proceeding for grinding?

A: Yes, it is possible with the BLACK CAM. See also explanation of splines above.

Q: Can you oscillate grind in both directions? X and Z

A: X and Z can interpolate together.

Q: Ist angedacht die K0010 auch in Schleiflänge 1500mm anzubieten? / Will you offer a 1500 mm version in the future?

A: For now we only offer a 1000 mm width center distance.

Q: Can we bring some customer in St. Gallen for see the machine or make demonstration?

A: We would love to show you our newest achievements.

Answers by Johannes Murer, Ivo Zeller & Werner Max Graf
May 5th, 2020