REISHAUER

Gear Grinding Technology

RZ 126 / 160 KWS 4.0

MACHINE | AUTOMATION | TOOLING | TECHNOLOGY | DIGITAL | SERVICES

Grinding parts with interfering contours

Swiss Precision.
Made by Reishauer.

Since it developed the world's first generating gear grinding machine, and with its constant drive for innovation, Reishauer has had a decisive influence on modern gear manufacturing. Reishauer's high-tech gear grinding machines, pioneering digital applications, economical tools and modern clamping devices make the manufacture of hard-wearing, efficient, low-noise gears possible.

Precision through Innovation

The developments in electromobility are dictating new requirements for drive technology. The need for enhanced gear quality and grinding gears with interfering contours increase the technical demands on the grinding process. To keep providing you with the productivity of generating grinding with Reishauer level quality and precision, we have further developed two variants from our proven Reishauer 4.0 model series. Both the RZ 126 KWS 4.0 and the RZ 160 KWS 4.0, the latter designed for larger workpieces, enable efficient generating grinding of gears with interfering contours.

When gears have interfering contours…

The Reishauer KWS series, featuring small diameter grinding worms, has enabled us to keep pace with the rapidly expanding electric mobility market. In this way, we have created further opportunities for our customers who require efficient high-volume production of high-precision gearing with collision-critical workpieces.

Fast, precise and efficient when producing in large numbers

Transmissions for electric drives are simpler and more straightforward than those used in combustion engines. As a result, e-transmissions are designed to be more compact, which in turn affects the design of the components. For this reason, gears for electric drives often feature dual gearing, which means design-related interfering contours can occur. Given these spatial restraints, hard finishing is not possible using standard grinding worms, while machining in large quantities using discontinuous grinding processes is uneconomical. In order to cover this segment of the market, Reishauer's product portfolio has been expanded with the development of the KWS 4.0 series, for gears up to 162 mm in diameter. The compact generating grinding worms can operate in significantly tighter areas than is possible with conventional diameters.

The limits of generating grinding: the illustration shows a component with interfering contours being machined using a standard diameter grinding worm

The KWS 4.0 series enables Reishauer to utilize the productivity advantages of continuous generating grinding, even when grinding workpieces with interfering contours.

The RZ 126 / 160 KWS 4.0 are...

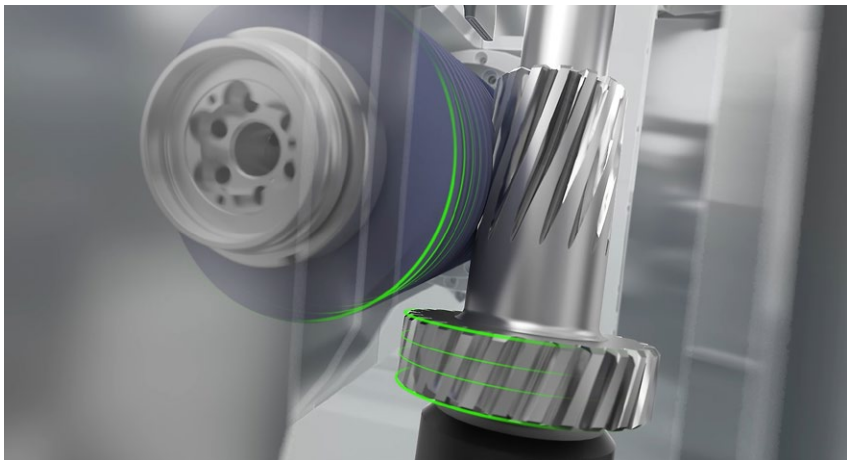
- the most efficient, most productive way to produce compact, heavy-duty drive parts
- our design variants, for the precision machining of gears with interfering contours
- optimally adaptable, ensuring stable grinding processes, which are the key for a stable high-volume production of efficient, low-noise transmissions
- a proven platform with familiar handling and operation, and yet an entirely new design
- our contribution to the success of e-mobility

... the Reishauer KWS is in its element!

If you look at processing times, generating gear grinding is superior to discontinuous grinding processes in practically all respects. In particular, the design of the grinding machine with two workpiece spindles enables loading to take place without affecting primary machining time. This can significantly shorten grinding cycles and thus achieve low unit costs.

Ensures the productivity advantages of continuous generating grinding

Developing the new KWS grinding head was a complex challenge, and required extensive research and investment. In view of the increasing demand by manufacturers for gearing to suit the high-power density of electric vehicles and e-bikes, Reishauer's hard work has come at exactly the right time.



Extended clearance limitation: Reishauer's KWS enables efficient generating gear grinding of workpieces with interfering contours

The reason for the greater development work required for Reishauer's KWS models lies in their cutting speed. As the grinding wheel diameter decreases, cutting speed tends to drop to an unfavorable level. In order to maintain it, ideally up to 80 m / s, spindle speed has to be nearly doubled, which generates dynamic and thermal disruptive effects. For this reason, the RZ 126 / 160 KWS 4.0 models have been fitted with a completely redesigned grinding head, which can process large numbers of workpieces with a high level of precision typical for Reishauer.

A further increase in productivity can be achieved by using the extensive range of equipment options available for Reishauer's 4.0 generation of products. In particular, our innovative ARGUS monitoring system, which can be used to evaluate and optimise grinding and dressing processes, and which recognises in advance the need for servicing and maintaining critical machine components, adds a major contribution to this.

The RZ 126 / 160 KWS 4.0 provide...

- the productivity advantages of generating grinding for workpieces that have interfering contours
- the highest part output and consistent quality
- a proven basis and a familiar user interface
- an extremely stable, low-vibration grinding head
- grinding wheel flanges machined in pairs for maximum precision
- all Reishauer technologies of the 4.0 generation (ARGUS Monitoring System, Twist Control, polish grinding, etc.)

Technical Specifications

	RZ 126 KWS 4.0	RZ 160 KWS 4.0
Outside workpiece diameter	5 – 130 mm	5 – 162 mm
Number of teeth	5 – 160	5 – 320
Grindable modules	0.5 – 4 mm	
Length of shaft	490 – 600 mm	
Swivel angle (grinding head)	± 40°	
Z-grinding stroke	max. 180 mm	
Grinding spindle speed	max. 13 500 min^{-1}	
Workspindle speed	max. 3 000 min^{-1}	
Cutting speed	max. 80 m / s	
Workpiece weight (incl. clamping device)	max. 30 kg	
Grinding wheel diameter	80 – 140 mm	
Grinding wheel width	max. 140 mm	
Outside diameter dressing tool	160 mm	
Machine weight (incl. W-axis)	9 800 kg	

All technical specifications are subject to change

Equipment

Standard Features
Single or double workpiece spindles
Dressing device CNC swivel axis
Workpiece spindles fitted with counter roller bearings
Linear encoders on all linear axes
NC controlled nozzle setting
Reishauer LowNoise Shifting
Swivel arm meshing device
Automatic balancing unit
Acoustic touch and crash detection
Emergency retract to protect machine and tooling
Central lubrication system of all linear axes
IO-Link sensors
Remote maintenance
Ergonomic operating panel with touch technology

Options (extract)
ARGUS Monitoring System
CNC tailstocks (W1- & W2-axis)
Tip dressing diamond for the grinding wheel diameter
Line dressing
Reishauer Twist Control
Reishauer ECO-Mode
Interface for automation systems
CO_2-fire extinguishing system
RZDesk offline programming station

Control
Siemens SINUMERIK ONE
Reishauer PrecisionDrive
Reishauer RZControl

All technical specifications are subject to change

The Reishauer Circle of Competence

The Reishauer Circle of Competence describes the entirety of our offering. Reishauer offers products and services around the grinding process completely from one source and thus guarantees a long service life of the machine system at low life cycle costs.

Machine

A broad portfolio, future-oriented controls, and interface concepts, and state-of-the-art grinding technologies – for decades, our machines have guaranteed the highest possible output with maximum precision, consistent quality, and unmatched machine availability.

Automation

Automation "Made by Reishauer". Our automation solutions are perfectly matched to our machines and keep pace with their high output. Modular in design, they can be flexibly tailored to your production needs.

Tooling

Perfectly matched, consistent in quality, and with guaranteed availability: Together with the machine, Reishauer tooling forms the backbone for your successful grinding processes.

Technology

With the development of powerful e-drives, the requirements for quality, surface finishes, and efficient gear geometries have increased significantly. Reishauer grinding technologies enable you to meet your customers´ most demanding requirements and help you remain competitive. Our technology experts are at your side with advice and support.

Digital

System integration, in-depth process analyses, predictive maintenance – the requirements for Industry 4.0 solutions are extremely complex and diverse. Reishauer offers you a constantly growing portfolio of digital services to maximize the potential of your machine.

Services

The reliability of our machines, and thus machine availability, is of central importance for your competitiveness. Shortest reaction time, a worldwide extended network of service engineers, and decentralized spare parts stores guarantee you maximum availability.

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