

Through-Feed Grinding Machines  
Series

# CES- II

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# CES-II

Years of experience in building "THROUGH FEED" grinding machines, coupled with our knowledge of what today's industry needs, gave the basis for the development of our CES-II series.

**The main design features of these machines are:**

- **Outstanding rigidity and vibration damping:** The massive cast-iron wheelhead housing is carried on built-in anti-vibration elements.
- **Robust, rigid wheelspindle:** Central bearings with hydraulic clamping system, especially suitable for high-speed grinding and milling.
- **Swivelling table:** With manual or programmable angular and parallelity correction and setting. Option: taper or angle grinding.



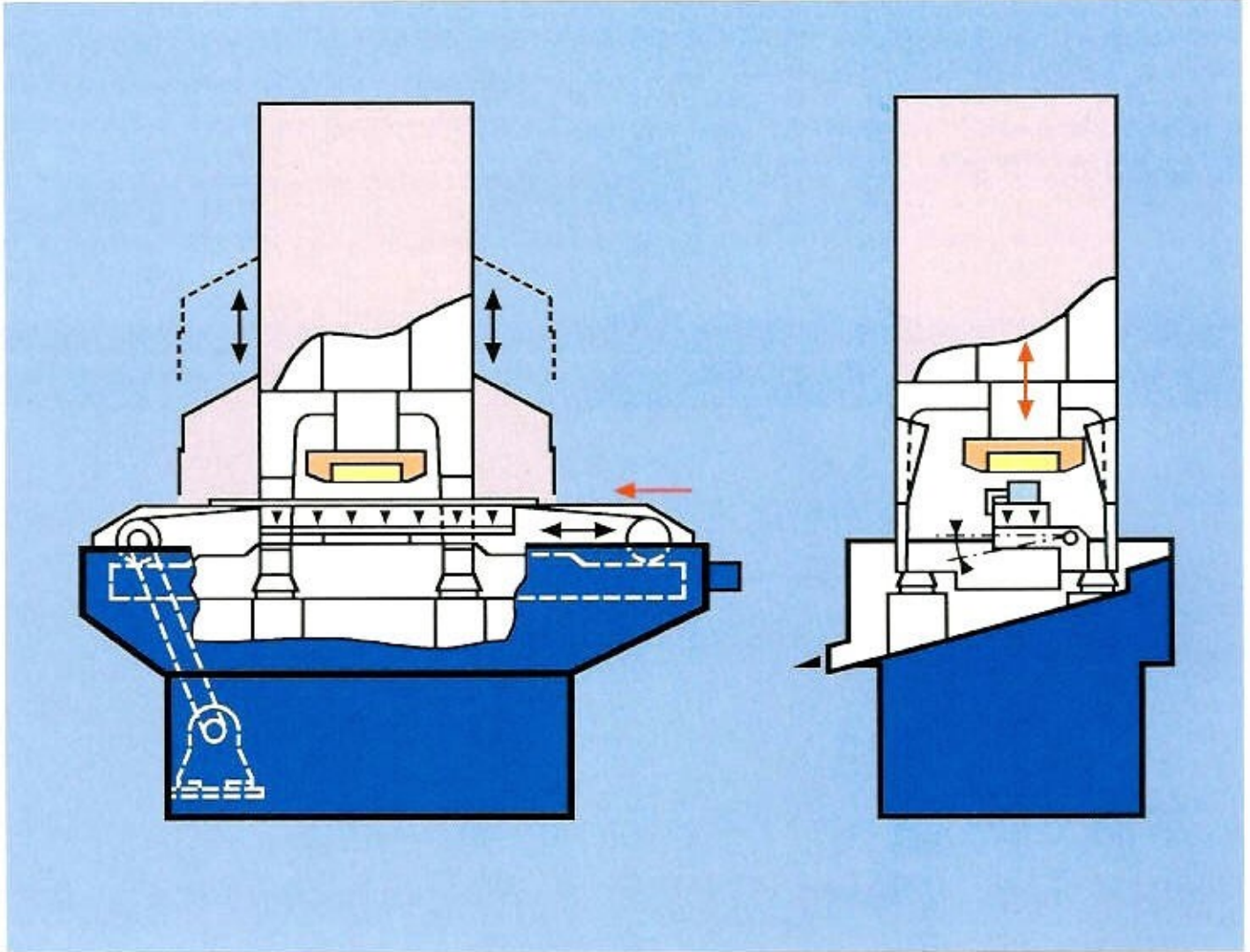
*1-station machine for vertical grinding*

- **Modular design concept:** Either conventional or special-purpose equipment built from standard components
- **Unbeatable range of peripherals:** Multi-station transfer lines, parts feeding, horizontal and vertical grinding, deburring, cleaning, washing, oriented delivery, etc.
- **Ease of operation and service:** efficient sludge removal, protection against coolant mist.
- **Efficient belt control:** Precise pneumatic tensioning, simple changing and positioning.
- **Simple wheel changing:** Fast, efficient, easy.



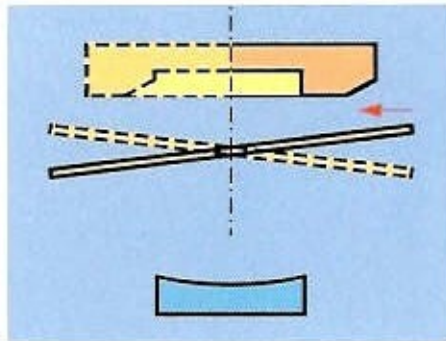
*2-station machine for vertical and horizontal grinding*

# The CES-II concept – user-experience plus future-oriented thinking

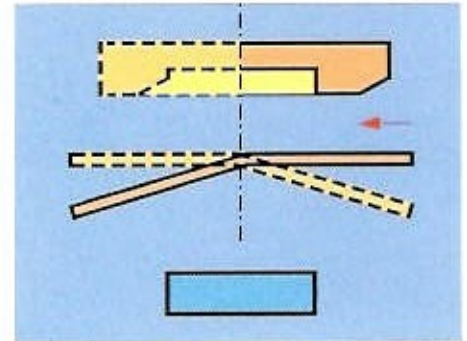


Two factors are decisive for the high productivity and accuracy of the CES-II series machines: attention to detail at the design stage, and first-class quality of all components.

**General description:** The massive, cast-iron wheelhead housing is carried on a rigid base by four built-in anti-vibration elements. The rough parts are loaded onto the through-feed belt on one side of the grinding wheel, and emerge on the other side fully ground. As the through-feed belt runs over a magnetic plate, the parts (if magnetic) are held in frictional contact with the belt, while being restrained against side forces by a rail.



*Grinding plate for longer parts: slide concavity according to tilt and width of parts, grinding on inlet and/or outlet side depending on application.*

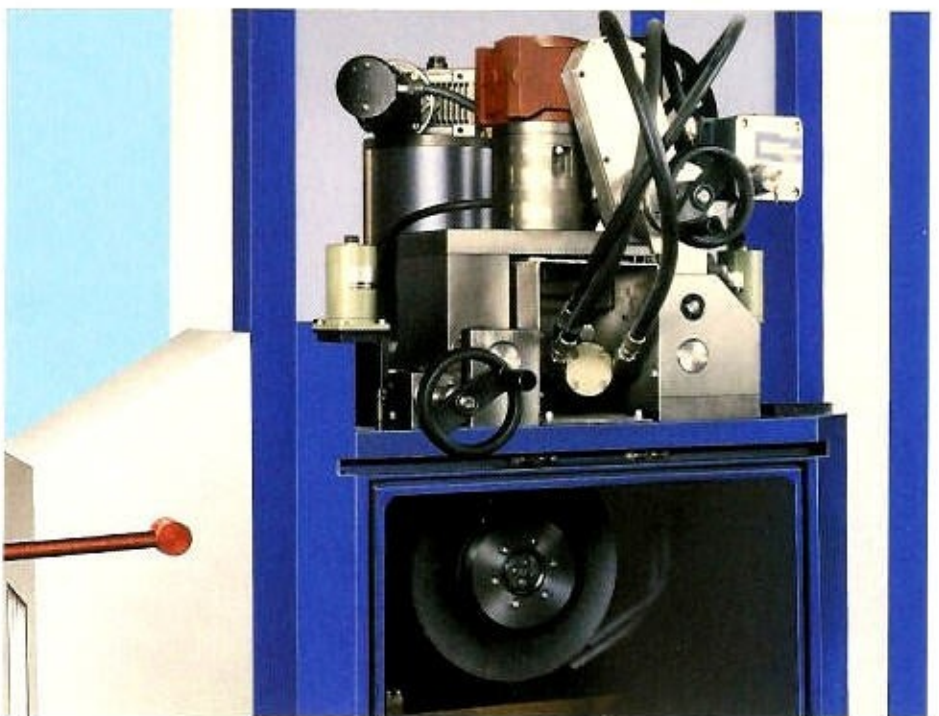
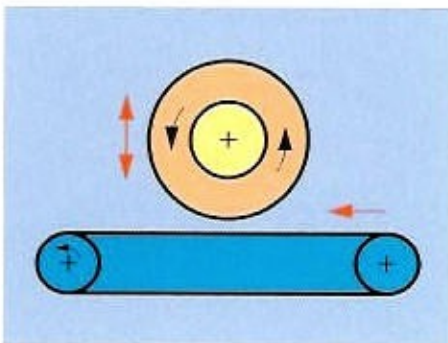
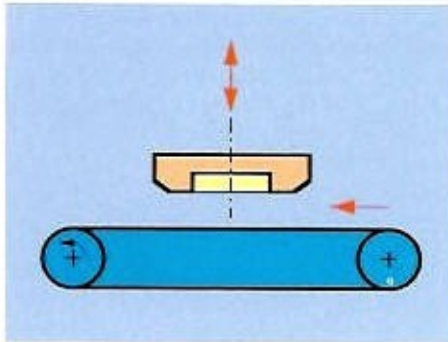


*Grinding plate for parts or assemblies up to about 200 mm (8") long: no concavity, grinding on inlet or outlet side depending on application.*

## For single or multi-station use: vertical and horizontal wheelheads

Vertical wheelheads are the usual choice for through-feed grinding, because the force can be resisted by a side rail, allowing heavy stock removal rates. However, for certain jobs a horizontal wheelhead is needed, and here the grinding force must be resisted by the transport system alone. If the pull from the magnetic plate cannot provide sufficient frictional force between the parts and the belt, part fixtures must be used. Horizontal wheelheads can thus be used only in certain cases.

*Vertical grinding station for universal use. Also applicable with two stations "roughing/finishing". Non-magnetic parts can often be ground without fixtures, dependent upon component configuration.*

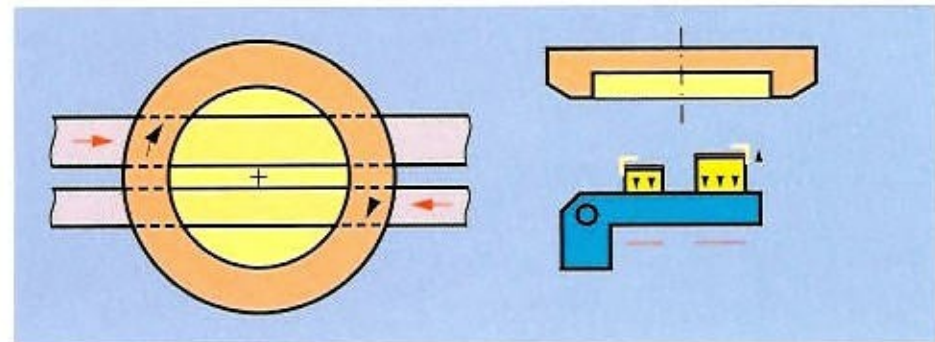
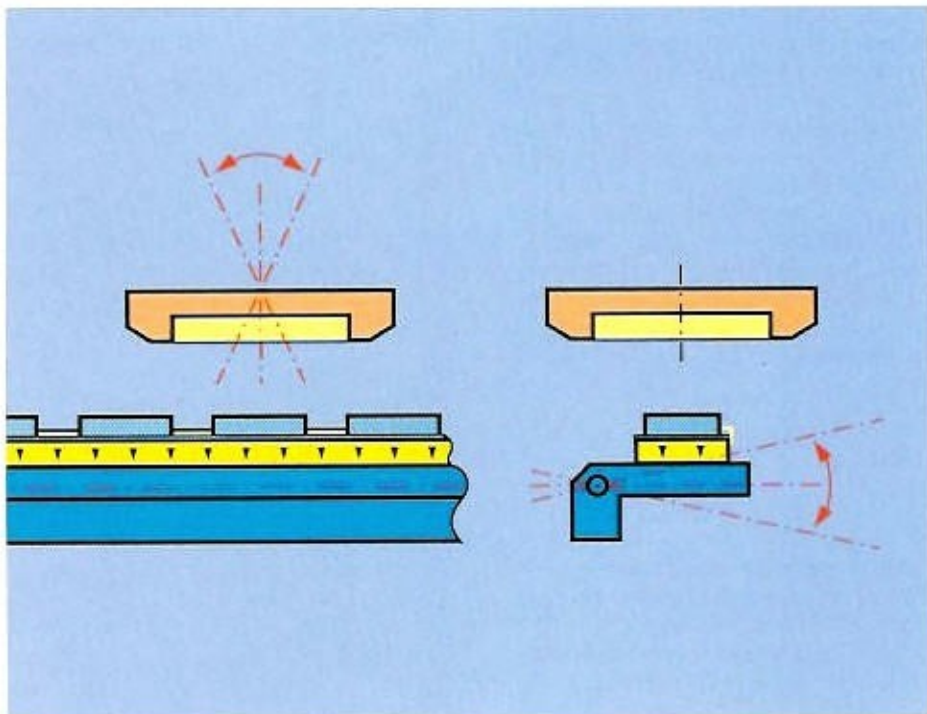


*Horizontal grinding station, specially for air-gap or slot grinding, and cutting. Only magnetic parts can be fed on a standard belt, for non-magnetic materials part fixtures must be used. Module combines with a vertical station.*

## Flexible design concept, wide applications

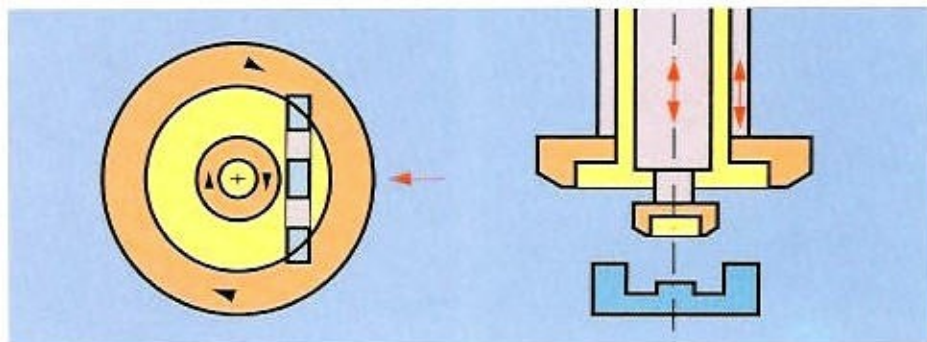
CES-II grinding machines can be assembled to suit the most varied production demands. The possibilities for spindle angle adjustment, table swivelling, «duplex» grinding, special wheelspindles, return and circulating conveyors, etc. allow machines to be built to cover a wide range of applications including special-purpose.

*Right: The heavy, swivelling table is built into the housing with ample clearance. For correcting parallelism, for best sludge removal, or for taper grinding (option), the table can be angled relative to the feed direction by a simple external control.*



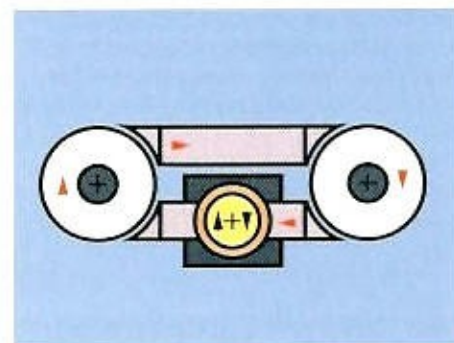
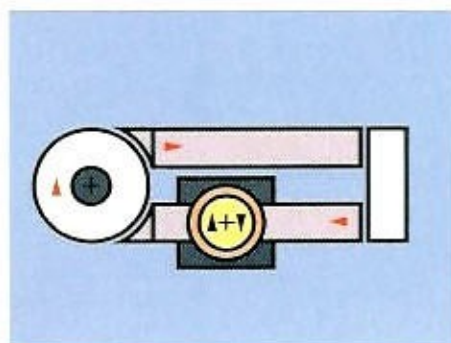
*Left: Duplex grinding, with a single wheelhead and 2 opposed running conveyor belts. One of the magnetic plates can be adjusted in height (the height difference between the two plates = the amount of stock removed in the second pass). For small parts needing to be ground on both faces, duplex grinding is highly cost-effective, even with the part-specific turning station that is needed.*

*Right: Special wheelspindle with additional concentric (or separate) HF spindle, stepless speed variation up to 60,000 r. p. m. Typical applications: simultaneous pole and air-gap grinding on E-cores.*



*Right: Feed return conveyor system: parts or fixtures returned to infeed side after grinding.*

*Right ext.: Circulating conveyor system: continuous loading and unloading of circulating fixtures.*

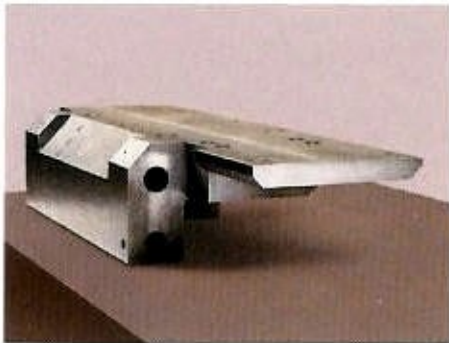
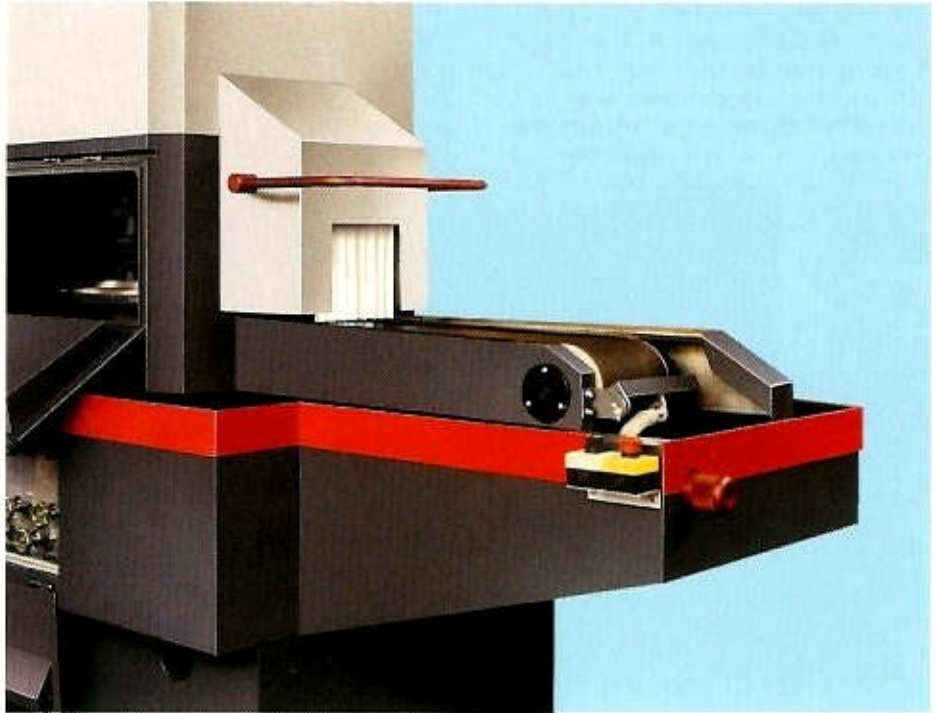


## Attention to detail: productivity, operating convenience, long life

The demands for high output and fine accuracy, made on today's machine tools, are so extreme that long service life can only be obtained from equipment that is designed and built with the utmost attention given to detail.

For FAMTEC, this care at all stages is coupled with years of experience in Through-Feed grinding technology, linked with a return information received from the customers, best known multi-national companies from all industrial sectors. These two factors help us ensure that we set our concepts correctly – including the details.

Rigidity for example: the housing, with integrated runoff tray, is a massive cast-iron structure giving a solid base for the wheelhead and the heavy swivelling table.



*Above: The cast-iron, swivelling table is solidly designed to absorb the grinding forces, and can be easily set to parallel or angle for taper grinding.*

*Right above: No obstacle to cause sludge buildup, inside the massive cast-iron housing.*

*Right: The base (shown here on a 2-station machine) contributes to rigidity. Note the big inclination for coolant return flow.*

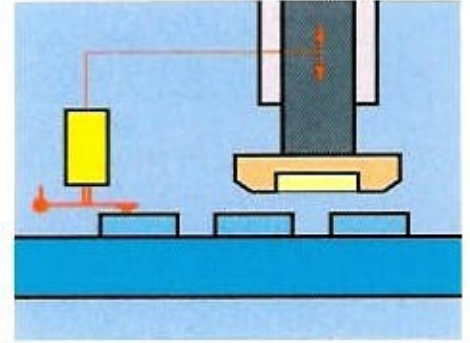
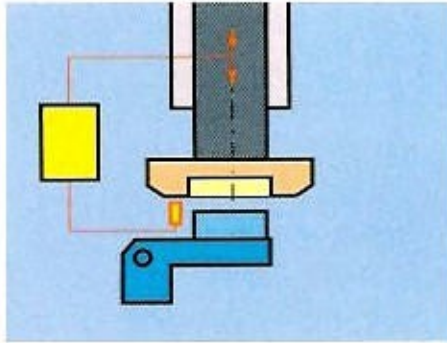


*Above: Comfortable, convenient operation: noise, fumes and liquids are enclosed inside a sturdy casing, but access for setup is easy, through large front and rear doors. The Through-Feed conveyor is designed for convenient loading, and the base covered against coolant mist.*



# Machines for industry's needs, through a wide range of accessories

Through-Feed grinding is mainly a mass-production process. The range of accessories is wide. Every FAM-TEC machine can be tailor-made for cost-effectiveness. Only some examples are shown on this page, detailed data sheets are available, and we will be glad to send you further information.

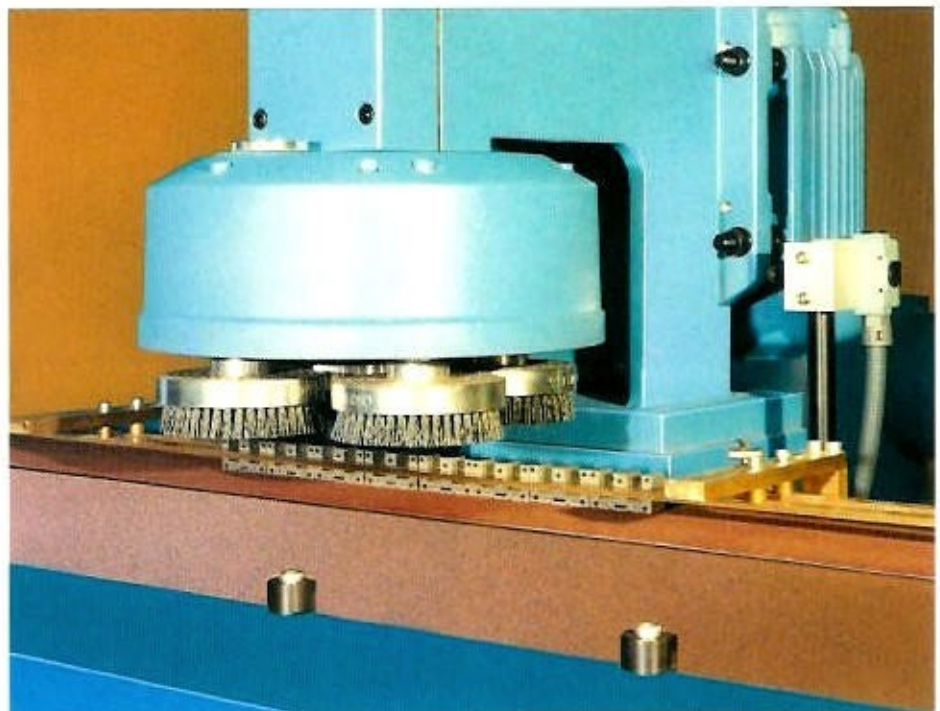


Top left: Automatic wheel wear compensation, through **dynamic pressure** against the grinding wheel. For normal work and long parts.

Top right: Automatic wheel wear compensation, through **direct feeler (post process) measurement** on the part immediately after exit from wheel. For close tolerances and high-swarf volume.

Above: **Wheel changing** made easy and fast by special device (optional). Lifting equipment outside the machine, and transfer plate for loading and unloading the grinding wheel.

Right: **Brush head, for deburring**, with or without coolant. Available as integrated or free-standing station. The rotary abrasive brushes are mounted in the rotating head.

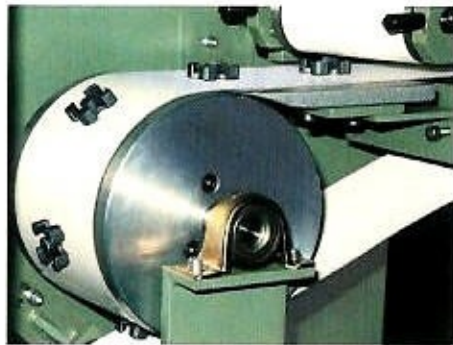
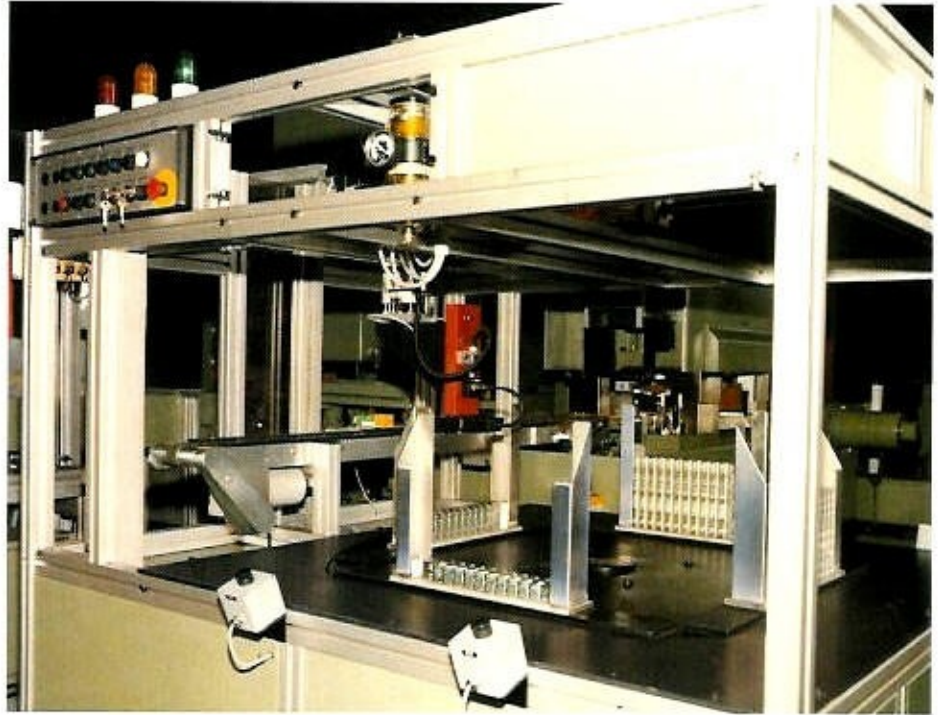




# Long experience in building customized grinding lines

To maximize productivity, operations are often linked by transfer systems. The grinding machine needs to have particularly well-matched peripheral equipment. On this page we show some examples of FAMTEC's capacity for supplying dry or wet-grinding machines that integrate perfectly into the customer's production line. Our long experience in designing and building equipment for parts feed and delivery, transfer, turning, deburring, washing, drying, automatic wheeldressing etc. allows us to offer the CES-II machine as a complete grinding line.

*Right: Automatic parts feeding on a through-feed grinding machine. Shown: Hedge trimmer blades loaded from an indexing magazine.*

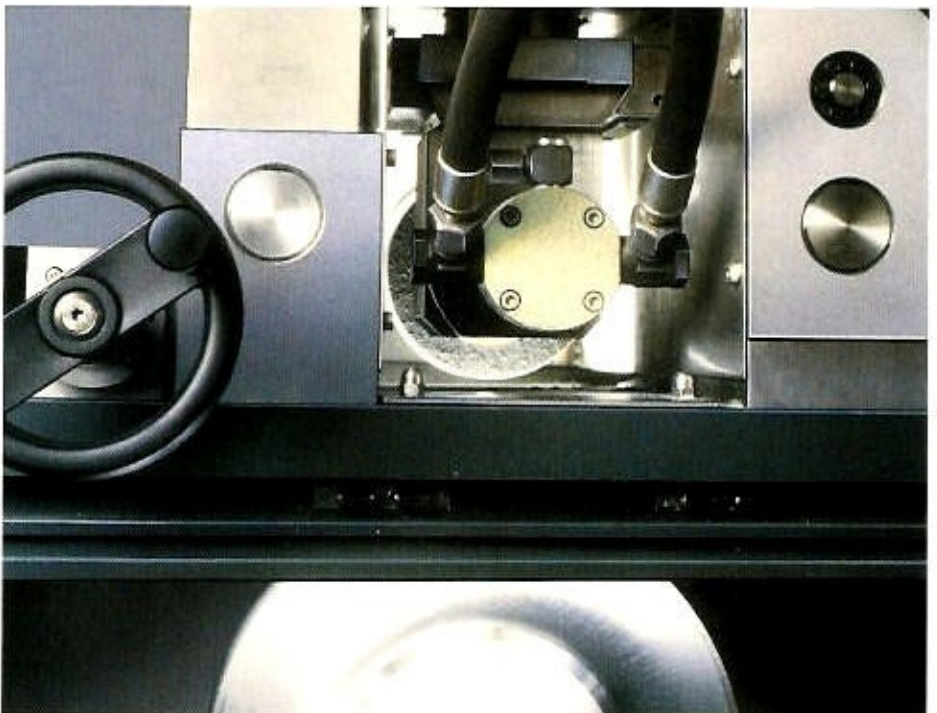


*Above: Automatic turning station for a «duplex» operation or between two machines. Shown: Ferrites turned by a magnetic drum.*

*Right: Automatic wheel dressing for vertical or horizontal stations. Shown: Automatic wheel dressing for horizontal station.*



*Left: Through-feed washing and drying module, with or without ultrasonic effect. Shown: Single-pass washing and drying, hot water, no ultrasonics, mainly used in the ferrite industry.*

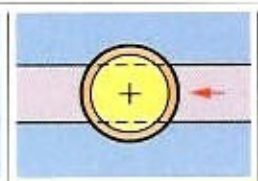
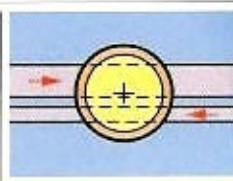
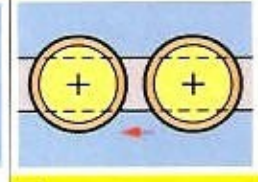
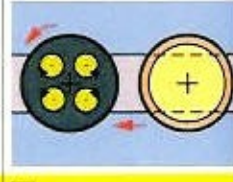
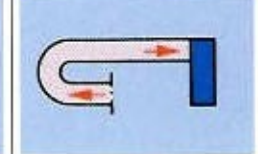



# Modular machine construction – versatile, optimized concepts for production grinding

These layouts demonstrate the versatility that our modular design concept gives. Whatever your requirements, we can build an optimized machine. The variants shown here are only those most often asked for; other combinations are possible, and any number of the single machines represented can be linked to form complete transfer lines. A line comprising linked Single-station machines often demands proportionately higher investment than a line with a multi station machine, but this is usually offset by better flexibility.

It should be noted that if parts need to be turned between operations, two separate conveyor belts are needed. Thus only the «duplex» variants **[B]** and **[T]** or two linked machines such as **[A]** and **[U]**, can be considered.

We build grinding lines mostly for high volume production. Our experience in this field has taught us that it is essential, for machines to be designed to match closely the production rate, cycle time, and mechanical features of the other equipment making up the line. Our on-the-spot agents and our own specialists are ready to analyse, together with the customer, the problem on hand, and to give a detailed quotation for a specific solution.

<h2>1-station-machines</h2>		
	<p><b>[A]</b>  <b>Type:</b> Universal machine with 1 vertical station, for grinding or milling.   <b>Application:</b> Universal, for surface grinding or milling.</p>	<p><b>[B]</b>  <b>Type:</b> Machine with 1 vertical station and duplex system.   <b>Application:</b> Surface grinding both sides of small parts in a single cycle, turning station <b>[T]</b> required.</p>
<h2>2-station-machines</h2>		
	<p><b>[I]</b>  <b>Type:</b> Machine with 2 vertical stations, for grinding or milling <b>[A] + [A]</b>.   <b>Application:</b> Rough/fine surface grinding on one side only, for large batches and heavy stock removal, with or without coolant.</p>	<p><b>[K]</b>  <b>Type:</b> Machine with 1 vertical and 1 deburring station, for grinding or milling <b>[A] + [D]</b>.   <b>Application:</b> Universal for surface grinding or milling with deburring in a single operation.</p>
<h2>Transport systems and accessories</h2>		
	<p><b>[R]</b>  <b>Type:</b> Return conveyor system.   <b>Application:</b> Universal system for returning parts and fixtures to the entry side of the machine.</p>	<p><b>[S]</b>  <b>Type:</b> Circulating conveyor system.   <b>Application:</b> For grinding with fixtures which can be loaded/unloaded without stopping.</p>

<p><b>C</b></p> <p><b>Type:</b> Machine with 1 special vertical station, comprising extra concentric spindle.</p> <p><b>Application:</b> Combined grinding of pole faces and air gap on E-cores.</p>	<p><b>D</b></p> <p><b>Type:</b> Machine with 1 brush-deburring station.</p> <p><b>Application:</b> Deburring on one side of flat parts, with or without coolant.</p>	<p><b>E</b></p> <p><b>Type:</b> Machine with 1 brush-deburring station and duplex system.</p> <p><b>Application:</b> Deburring on both sides of flat parts in a single cycle, with or without coolant, turning station <b>T</b> required.</p>	<p><b>F</b></p> <p><b>Type:</b> Machine with 1 horizontal station.</p> <p><b>Application:</b> Special application for magnetic materials for the conveyor, or parts clamped in fixtures.</p>	<p><b>G</b></p> <p><b>Type:</b> Machine with 1 special, 3-wheel-head, horizontal station.</p> <p><b>Application:</b> Grinding the pole surfaces and air-gaps of ferrite E-cores in a single cycle, gap depth adjustable.</p>	<p><b>H</b></p> <p><b>Type:</b> Machine with 1 horizontal cutoff or slot grinding station.</p> <p><b>Application:</b> Cutting off, or slot grinding, on parts such as ferrite cores, brake pads, etc.</p>
<p><b>I</b></p> <p><b>Type:</b> Machine with 2 horizontal stations <b>F</b> + <b>G</b></p> <p><b>Application:</b> Pre-grinding air gaps and finish grinding all 3 poles, on ferrite E-cores.</p>	<p><b>M</b></p> <p><b>Type:</b> Machine with 2 horizontal cutoff stations <b>H</b> + <b>H</b></p> <p><b>Application:</b> Cutting off ferrite E-cores in mass production, machining in 2 parallel rows.</p>	<p><b>N</b></p> <p><b>Type:</b> Machine with 1 horizontal slot grinding and 1 vertical grinding station <b>H</b> + <b>A</b></p> <p><b>Application:</b> Single-cycle machining, e.g. slots and surfaces on brake pads, without coolant.</p>	<p><b>O</b></p> <p><b>Type:</b> Machine with 1 vertical and 1 horizontal grinding station <b>A</b> + <b>F</b></p> <p><b>Application:</b> Surface and profile grinding in one operation, e.g. E-cores, air gaps, flat surfaces.</p>	<p><b>P</b></p> <p><b>Type:</b> Machine with 1 horizontal and 1 vertical grinding station <b>F</b> + <b>A</b></p> <p><b>Application:</b> Air gap and surface grinding on E-cores for contactors.</p>	<p><b>Q</b></p> <p><b>Type:</b> Machine with 1 vertical station and 1 special, 3-wheel-head horizontal station.</p> <p><b>Application:</b> Special machine for ferrite E-cores, pregrinding and finish-grinding of all three poles.</p>
<p><b>T</b></p> <p><b>Type:</b> Turning station for duplex system.</p> <p><b>Application:</b> For turning parts between operations, different versions available to suit workpieces.</p>	<p><b>U</b></p> <p><b>Type:</b> Turning and transfer between 2 machines.</p> <p><b>Application:</b> For turning parts and linking 2 machines, different versions available according to workpieces.</p>	<p><b>V</b></p> <p><b>Type:</b> Link between 2 conveyor belts.</p> <p><b>Application:</b> For magnetic lifting of parts between 2 conveyor belts without risk of jamming.</p>	<p><b>W</b></p> <p><b>Type:</b> Coolant filtration unit.</p> <p><b>Application:</b> Any wet-grinding needs a coolant filtration unit. Available according application also with refrigerator.</p>	<p><b>X</b></p> <p><b>Type:</b> Suction extractor.</p> <p><b>Application:</b> For dust extraction in dry grinding, with outlet filter, various versions for different uses.</p>	<p><b>Y</b></p> <p><b>Type:</b> Special washing and drying unit.</p> <p><b>Application:</b> Through-feed washing and drying, with or without ultrasonics.</p>

## The through-feed method: efficient also for other applications

**High-speed milling:** the CES-II machines, with their outstanding rigidity and good swarf evacuation, also provide an efficient method for high-speed milling with polycrystalline diamond or CBN inserts. The linear layout of the machines is especially suitable for machining sealing faces on aluminium housings, where the magnetic force can be used for part fixture transport and clamping. Excellent flatness values can be obtained by pairing a "roughing" with a "finishing" station: the distortion often occurring after the roughing operation due to release of stresses, is removed in the finishing phase, so obtaining perfect flatness.



**Strip grinding:** two processes can be established.

**Thick strips**, which are rigid, can be ground on standard CES-II machines with a special attachment, in the through-feed process.

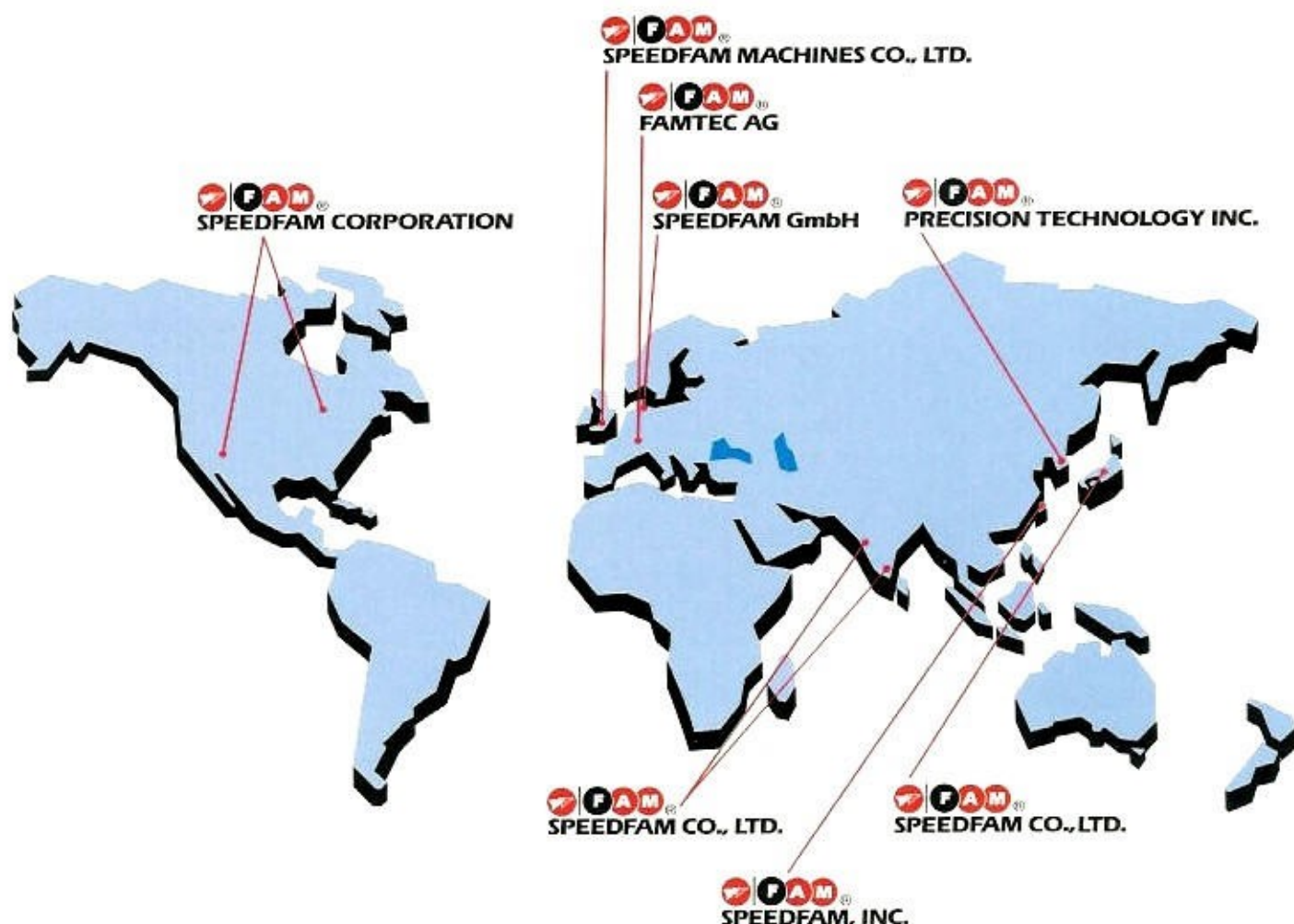
**Thin strips**, flexible, are fed through rollers direct from the coil, and if necessary polished after grinding. For this work, FAMTEC has developed a special, modular range of machines, that can be built with the appropriate number of grinding and polishing stations.

The machine illustrated is for grinding sealing strips for pneumatic cylinders, and consists of 2 grinding and 2 polishing stations, with integrated automatic sensing and compensation for the grinding and polishing wheel.





# FAMTEC – Worldwide active and present



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