VECTOR™

CMT

high output, low overhead

cylindrical grinding machines

CMT CURTIS MACHINE TOOLS LTD
www.curtisgrinding.com

application guide

The VECTOR basic unit is a compact small-parts production machine in which grinding and parts handling are fully integrated.

All machines in the range share the same grinding platform, with a long radial stroke and a short axial stroke, for single and multi-plunge grinding, or peel grinding short profiles.

The wheel guard encompasses the workpiece and rear dresser, with a shutter for loading access. Grinding fluid and debris is retained within the machine.

A variety of work locating and driving solutions is available, configurable for straight or angled approach with optional in-process gauging.

The machine structure incorporates a 3-axis robot, and a transitional parts storage area. Parts can be buffered in pallets using drawers, or transferred in and out using linear systems. Secondary processes such as gauging (pre- and post-), orientation, deburring, etc. are possible.

The layout makes for easy integration into the broader manufacturing environment, whether using manual transfer of pallets, or linked linear transfer.

Vector...

...is the name for a growing range of machines, each variant having qualities suited to niche applications:

Basic The mainstay of the marque, with conventional workholding and cartesian robot work handler. Has a wide application range and the greatest potential for re-tooling for future re-use.

Concentric Centreless grinder with steel control wheel, workrest blade and 'concentric' pressure roller. For secondary operations on parts having a cylindrical body. Loading by hopper or vibratory feeder

Twin Indexing twin-spindle workhead, which enables loading (and some secondary operations) concurrently with grinding. Greatest advantage when grinding times are short.

GFS A barfeed unit with puller unit and cut-off blade enables parts to be Ground From Solid rod. Offload can be by gravity or robot. Advantageous for small parts less than 5 mm diameter

Rotary A special workhead is mounted in a programmable 'B' axis. 3-axis simultaneous interpolation is possible for generation of forms in materials not suited to plunge grinding.

Turboshaft vane profile and groove grinding

The high rigidity of the Vector spindle makes fast metal removal rates possible with interrupted cutting. For medium volume production, the Vector Basic with conventional abrasive wheels can be used to plunge grind the groove and form together. For higher volumes, the Vector Twin with superabrasive wheels gives optimum spindle utilisation. Parts handling may be via multi-position pallets, single-part pallets with through conveyor, or linear transfer without pallets. Options include post-process gauging and post-process deburring.

Base level specification

Floor plan drawing

Common to all variants:

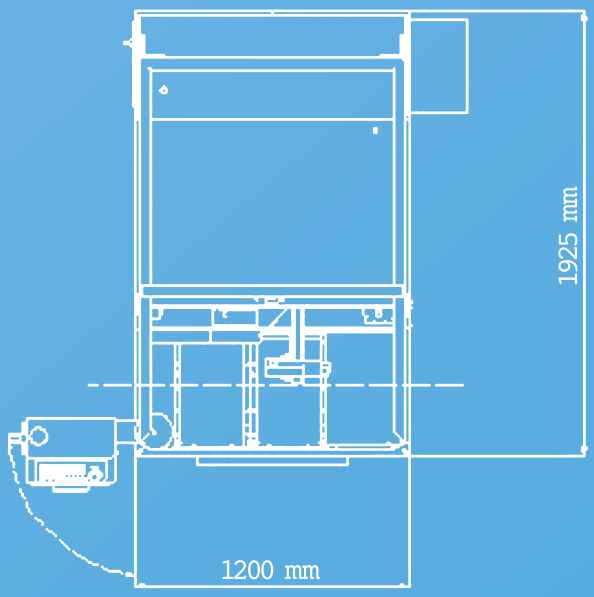
Maximum grinding wheel diameter	457 mm
Maximum grinding wheel width	50 mm
Grinding wheel bore diameter	152 mm/ 203 mm
Grinding spindle power	5.5 kW
Maximum wheel speed	5000 rpm
Travel 'X' direction	190 mm
Travel 'Z' direction	60 mm
Workhead platform height	150 mm
Control system	Siemens 840D
Maximum number of axes (including robot)	8

Robot + Drawer system

Payload workpiece + grippers	6 kg
'U' – 'V' – 'W' travels	780 mm x 450 mm x 340 mm
Pallet area	2 x 325 mm x 325 mm

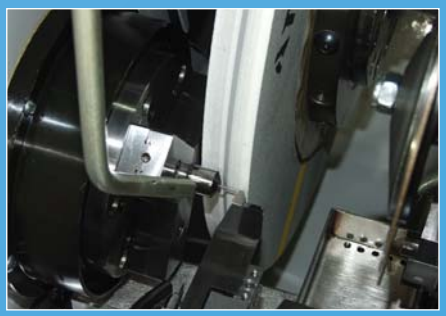
Workpiece size guide

Maximum diameter	110 mm
Maximum length between centres	160 mm
Maximum length ground in two plunges	100 mm



Diesel injector parts

Many components may be ground in a single or double plunge process, on either the Vector Basic or Vector Twin. Engineered solutions exist for many different parts. The Vector GFS utilises a bar feed system for grinding from solid feed stock up to 5 mm diameter.



Superabrasives

Precisely repeatable grinding wheel location facilitates the use of metal plated superabrasive wheels with their potential for high cutting rates and low consumable cost. Containment of coolant and debris is a particularly advantageous feature when grinding carbide, ceramics and diamond.

Centre - thread grinding on Vector Basic with electroplated CBN

Right – groove grinding ceramic shafts on Vector Concentric using electroplated diamond

Attributes common to the whole Vector range

1 Fitness

Designed to maximise output from available floor space and labour resources. Low operator attendance is possible with the inbuilt parts storage system, and the small footprint is consistent with compact cell structures.

2 Lifetime economy

The Vector provides dependable precision and high cycle rates, yet simplicity and economy of design means maintenance is straightforward and infrequent. Wear parts are specified for long lifetime and easy replacement.

3 Cleanliness

The small grinding enclosure allows dirt and debris to be fully flushed by the coolant, and out of contact with the operator. This means working parts remain clean, prolonging life and improving reliability.

4 Consistency

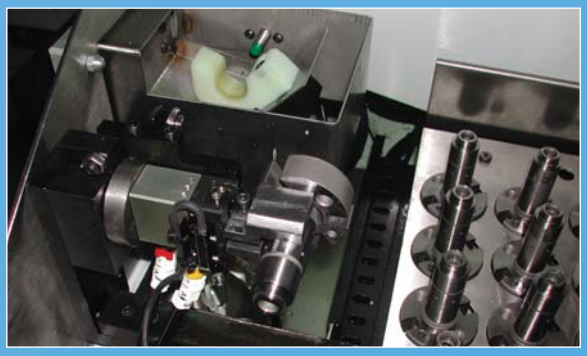
Benefits of the small size and rigid construction are good thermal stability and high static and dynamic stiffness, giving reduced requirement for warm-up and shorter spark-out times.

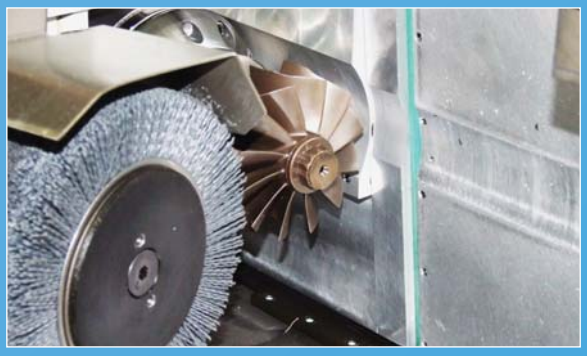
5 Flexibility

A wide range of options exist for work handling, work holding, wheel dressing, gauging and monitoring, plus possibilities for extra operations like part orientation, pre-gauging or de-burring.

6 Longevity

When the original application comes to an end, and a significantly different requirement arises, CMT offer a service that includes feasibility study, retooling and re-qualification, plus machine updating as necessary.





CMT CURTIS MACHINE TOOLS LTD

Martells Industrial Estate, Slough Lane, Ardleigh, Colchester, Essex CO7 7RU. England
Tel: +44 (0)1206 230 032 **Fax:** +44 (0)1206 231 426 **Email:** info@curtisgrinding.co.uk
www.curtisgrinding.com