

JONES &  
SHIPMAN

# ULTRAMAT

## Cylindrical Grinder Range

GE-Fanuc® Touchscreen or CNC Control, AC Drives & Motors  
12" x 25.5" (300 x 650mm) or 12" x 40" (300 x 1000mm) Grinding Capacity





Outside



Inside



Face



## DESIGN & BUILD

Available with easy to use 'Self Teach' Touch Panel Technology or Operator Friendly CNC with Windows® based software. Ultramat can accommodate one off, batch or high volume production and will hold the tightest of tolerances. Robust construction and designed with the ability to incorporate the latest developments in gaging and autoloading ensure that Ultramat from Jones & Shipman will fulfill your grinding needs.

### Wheelhead - Plain (straight approach)

A robust external only wheelhead featuring a belt driven angular contact rolling element bearing cartridge and wheelguards with retracting lower wheel safety visors.

- Wheels up to 500mm diameter
- 10 hp (7.5 kW) Motor minimum
- Programmable Constant 20" (500mm) Peripheral Wheel Speed
- Wheel Speeds 8860 SFPM (45m/s) and 12400 SFPM (63m/s) or more available.



Plain (straight approach) wheelhead

### Wheelhead - Universal (swivelling)

This wheelhead incorporates independent external and internal wheelspindle drives. The hardened and ground external wheelspindle can accommodate a grinding wheel at either end. For normal cylindrical grinding operations a 16" x 2" (400 x 50mm) wheel is mounted on the left hand side, while for face and some form grinding operations a 12" x 1" (300 x 25mm) wheel can be mounted on the right hand side. For ease of set-up when swivelling the wheelhead, an airlift facility is provided. Further options include Angle Head and twin 'B' or full 'B' axis wheelheads both with Holroyd high precision worm & wheel assemblies for infinitely variable rotation.



'B' Axis



Twin 'B' Axis

### Slideways

Hand scraped vee and flat slideways are provided for both cast machine table and wheelhead back slide. Turcite coated bearing surfaces, automatically lubricated, assure low friction movement. Both axes are ball screw driven and controlled by A.C. servo motors with air purged, linear scales.

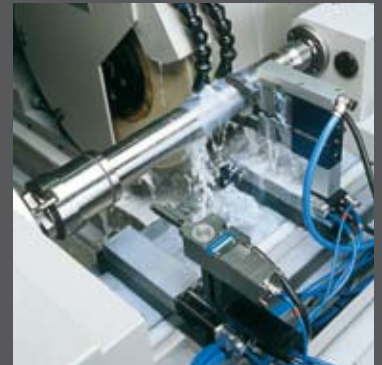
### Workhead and Tailstock

The live and dead single spindle workhead contains robust, high precision tapered roller bearings for superior stiffness.

A variable speed AC servo drive to the spindle with encoder ensures fast and accurate spindle orientation.

The machine table slide swivels for taper correction.

A high accuracy taper correction tailstock can also be provided as an option, if required. Thermal stability in the work area is ensured by porting coolant through the structure of the workhead, tailstock and on a plain spindle machine through the wheelhead.



# CONTROLS TO SUIT ALL APPLICATIONS

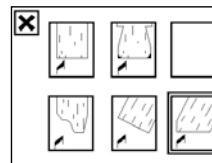
## Ultramat Easy

The Ultramat Easy has been specifically developed in response to industry demands for a precision grinder that offers the advantages of microprocessor control without the complexity of traditional CNC systems. The new operator interface is extremely simple and easy-to-use requiring no computer knowledge.

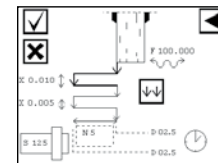
Easy to use 'Touch Screen' combined with Electronic Handwheels, DRO displays and membrane type touch keys enable the operator to quickly produce his first component.

A welcome addition to the Ultramat range it allies the technical innovations of both Jones & Shipman and GE-Fanuc®. Combining a simple touchscreen system and Jones & Shipman software suite to offer users quick setting for simple or complex jobs on a proven reliable platform. Ultramat Easy offers the operator three simple options, Manual Grind, Single Cycle, or Link individual dress and grind cycles into a repeatable combination.

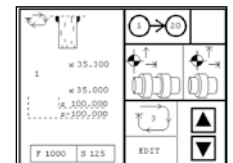
On a Universal machine full internal features, including multi-bore grinding, are also available.



Dress cycle select



Traverse Grind feed rates



Link cycles

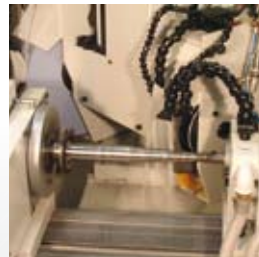
## Ultramat CNC



Autoloading



Thread Grinding



Multiwheel Option



Form Grinding



Form Dressing

### Jones & Shipman Developed Windows® Programming

A full suite of dressing and grinding programs is available for the Ultramat CNC operator. Easy to follow Windows® set up pages allow the operator to digitize diamond and wheel positions and by a minimum of mouse or softkey/keyboard inputs produce a finished program.

Graphical images prompt the operator and spreadsheet style programming ensures quick and simple input. The option of ISO programming is also available if required.

Ease of operation and Windows® based programming make Ultramat CNC the operator's choice.

A GE-Fanuc® CNC Intelligent Terminal, with associated GE-Fanuc® digital AC servos and a Windows® user interface provide the machine control.

All control gear is housed in an easily accessible cabinet incorporated into the machine. A temperature controlled cabinet option is available.

Remote diagnostics available by telephone or internet.



# SPECIFICATIONS - ULTRAMAT RANGE

## General Specifications

Maximum length between centers:	25.6" (650mm)
Two options available	Option 1 Option 2
Center height	6.3" (160mm)
Maximum workpiece weight between centers	220lb (100kg)
Maximum workpiece weight between centers - option	330lb (150kg)

## Wheelslide (X Axis)

Total infeed	10.2" (260mm)
Maximum traverse speed	19.7 ft/min (6m/min)
Maximum programmable diametrical infeed rate per min.	3.9" (100mm)
Minimum programmable increment Ø, CNC models	0.00001" (0.0001mm)
Minimum programmable increment Ø, Easy models	0.0001" (0.001mm)
Electronic Handwheel increments, CNC models	0.00001", 0.0001", 0.001", 0.01" (0.0001, 0.001, 0.01, 0.1mm)
Electronic Handwheel increments, Easy models	0.0001", 0.001", 0.01" (0.001, 0.01, 0.1mm)

## Tableslide (Z Axis)

Maximum stroke length	29.5" (750mm)
Option 1 - 25.6" (650mm) between centers model	45.3" (1150mm)
Option 2 - 39.4" (1000mm) between centers model	39.4 ft/min (12m/min)
Maximum traverse speed	0.00001" (0.0001mm)
Minimum programmable increment, CNC models	0.0001" (0.001mm)
Minimum programmable increment, Easy models	0.00001", 0.0001", 0.001", 0.01" (0.0001, 0.001, 0.01, 0.1mm)
Electronic Handwheel increments, CNC models	0.0001", 0.001", 0.01" (0.001, 0.01, 0.1mm)
Electronic Handwheel increments, Easy models	0.0001", 0.001", 0.01" (0.001, 0.01, 0.1mm)
Table swivel clockwise/anticlockwise, inclusive option 1	16° / 18°
Table swivel clockwise/anticlockwise, inclusive option 2	11° / 16°

## Wheelheads

### Plain (Straight approach)

Grinding wheel	Diameter maximum	20" (500mm)
	Width (Option)	2" (50mm) (3" (80mm))
	Bore	8" (203.2mm)
Wheel speed		8860 SFPM (45m/s)
Motor power		10 hp (7.5 kW)

### Swivelling (Universal)

Grinding wheel	Diameter maximum	16" (400mm)
Left hand	Width	2" (50mm)
	Bore	5" (127mm)
Wheel speed		6500 SFPM (33m/s)
Motor power		5.5 hp (4 kW)
Grinding wheel, Right hand (option)	Diameter maximum	12" (300mm)
	Width	1" (25mm)
	Bore	5" (127mm)
Wheel speed		6500 SFPM (33m/s)
Motor power		5.5 hp (4 kW)
Internal grinding spindles (Option)	spindle speed	29,000 rpm
10 - 20mm Ø capacity (Option),	spindle speed	16,500 rpm
25 - 40mm Ø capacity (Standard),	spindle speed	10,500 rpm
50 - 65mm Ø capacity (Option),		3.14" (80mm)
Internal spindle bracket bore		3 hp (2.2 kW)
Motor power		

## Workheads

Dead center fixed base (Standard)	
Speed range, continuously variable, rpm	0 - 660
Spindle taper	5MT
Output torque, (continuous rating)	27 Nm
Motor power	1.5 hp (1.1 kW)
Live & dead center, swivel base (Option)	
Speed range, continuously variable, rpm	0 - 660
Spindle taper	5MT
Output torque, (continuous rating)	27 Nm
Motor power	1.5 hp (1.1 kW)
Swivel angle	-15° - +90°

## Tailstocks

Plain tailstock (Standard)	
Poppet diameter	1.96" (50mm)
Poppet taper	3MT
Center travel	1.18" (30mm)
Poppet pressure, adjustable	60 - 410 N

## Taper Control tailstock (Option)

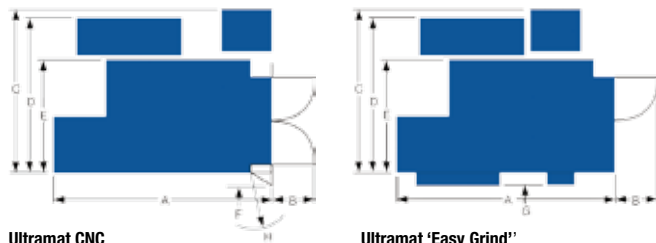
Poppet diameter	1.96" (50mm)
Poppet taper	3MT
Center travel	1.18" (30mm)
Poppet pressure, adjustable	60 - 410 N
Maximum adjustment on diameter	0.008" (0.2mm)
Smallest diametrical graduation	0.00002" (0.0005mm)

# Control Systems

Ultramat Easy Grind GE-Fanuc® Powermate® motion control	
Number of axes controlled	2
Ultramat CNC – GE-Fanuc® 210i control	
Number of axes controlled	3

## Shipping Dimensions

Net weight, approximate	
Ultramat Easy, 25.6" (650mm) between centers	10584 lb (4800 kg)
Ultramat Easy, 39.4" (1000mm) between centers	11576 lb (5250 kg)
Ultramat CNC, 25.6" (650mm) between centers	10804 lb (4900 kg)
Ultramat CNC, 39.4" (1000mm) between centers	11796 lb (5350 kg)
Gross weight, approximate	
Ultramat Easy, 25.6" (650mm) between centers	11686 lb (5300 kg)
Ultramat Easy, 39.4" (1000mm) between centers	12678 lb (5750 kg)
Ultramat CNC, 25.6" (650mm) between centers	11907 lb (5400 kg)
Ultramat CNC, 39.4" (1000mm) between centers	12899 lb (5850 kg)
Shipping dimensions, approximate	
Ultramat Easy, 25.6" (650mm) between centers	513.75 ft3 (14,55m3)
Ultramat Easy, 39.4" (1000mm) between centers	589.65 ft3 (16,70m3)
Ultramat CNC, 25.6" (650mm) between centers	550.85 ft3 (15,60m3)
Ultramat CNC, 39.4" (1000mm) between centers	631.60 ft3 (17,88m3)



<b>Ultramat CNC</b>	<b>1000 Model</b>	<b>Ultramat 'Easy Grind'</b>	<b>1000 Model</b>
<b>650 Model</b>	<b>650 Model</b>	<b>650 Model</b>	<b>650 Model</b>
A - 121.26" (3080mm)	A - 150.98" (3835mm)	A - 109.65" (2785mm)	A - 139.37" (3540mm)
B - 25.39" (675mm)	B - 31.77" (807mm)	B - 34.76" (883mm)	B - 34.76" (883mm)
C - 103.82" (2637mm)	C - 97.64" (2480mm)	C - 96.26" (2445mm)	C - 96.26" (2445mm)
D - 86.02" (2185mm)	D - 94.49" (2400mm)	D - 86.02" (2185mm)	D - 86.02" (2185mm)
E - 72.44" (1840mm)	E - 72.44" (1840mm)	E - 72.44" (1840mm)	E - 72.44" (1840mm)
F - 5.0" (127mm)	H - 60.67" (1541mm)	G - 11.38" (289mm)	G - 11.38" (289mm)
<b>Machine Height - 75.40" (1915mm)</b>			

## Performance



### Repeatability

X and Z axis repeatability 0.00008" (0,002mm) to 6 Sigma all models



### Roundness

Dead Centers 0.00001" (0,00025mm) LSC\*  
Live Spindle 0.00002" (0,0005mm) LSC\*  
\* Least square circle (using standard wheel and hardened test piece).



### Surface Finish

2µin Ra (0,05µm Ra) (Using standard wheel and hardened test piece, improved Ra values can be obtained by using selected grades of grinding wheels applicable to the material being ground).



### Straightness

650 model - 0.00010" (0,0025mm) , using 25.6" (650) x 4" (100mm) test bar  
1000 model - 0.00014" (0,0035mm) , using 40" (1000) x 4" (100mm) test bar

## CUSTOMER WARRANTY

**All Jones & Shipman precision grinders come with a minimum twelve months comprehensive Warranty covering both parts and service.**

Further information on Customer Warranty is detailed in our Conditions of Sale, subject to amendments for particular models and the specific markets into which they are sold.

Our endeavour is to supply machines that embody the latest developments in design and therefore, while the illustrations, text and specifications contained within this brochure are correct at the time of printing, we reserve the right to modify the design and construction of machines and equipment at any time without notice.

In the interests of safety, customers are reminded that when purchasing any technical product for use at work (or otherwise), any additional or up-to-date information and guidance, which it has not been possible to include in the publication, should be obtained by you from your local sales office in relation to the suitability and the safe and proper use of the product. All relevant information and guidance must be passed on by you to the person engaged in, or likely to be affected by or responsible for the use of the product.

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