

# CHECK THE DIFFERENCES BEFORE YOU INVEST

We are so confident that the Harrison Alpha is the best lathe on the market that we want you to compare it with any other lathe.

# ALPHA XS/XM



## THE ULTIMATE TURNING MACHINES

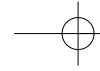


Feature	Alpha	Other Lathe
<b>Machine</b>		
Warren type bed for excellent swarf clearance	✓	<input type="checkbox"/>
Stress free bed mounting (not achievable with all cast iron beds)	✓	<input type="checkbox"/>
Gap piece standard for extra capacity and versatility	✓	<input type="checkbox"/>
3 speed all electric automatic selection headstock gearbox (2 speeds on 1800XS)	✓	<input type="checkbox"/>
Full torque at speeds as low as 64 rpm	✓	<input type="checkbox"/>
"One-click-one-micron" feel handwheels	✓	<input type="checkbox"/>
GAMET super high precision taper roller bearings ABEC 9 equivalent	✓	<input type="checkbox"/>
Built to DIN8605 toolroom accuracy	✓	<input type="checkbox"/>
Full C Axis and milling capability available	✓	<input type="checkbox"/>
40:1 continuous spindle motor power	✓	<input type="checkbox"/>
Power failure braking	✓	<input type="checkbox"/>
World's largest builder of manual/CNC lathes	✓	<input type="checkbox"/>
Machine and control designed and built as a complete solution (i.e. NOT a retrofit)	✓	<input type="checkbox"/>
<b>Control</b>		
Full Fanuc package, motors, drives, magnetics and turnkey electrical control panel	✓	<input type="checkbox"/>
Alpha System tool setting simplicity	✓	<input type="checkbox"/>
Two control software systems accessed via a keyswitch	✓	<input type="checkbox"/>
Free CAD/CAM CD for off line flexibility	✓	<input type="checkbox"/>
Absolute encoders (no need to reference on start up)	✓	<input type="checkbox"/>
Custom built CNC (no PC crash, slow operation or viruses)	✓	<input type="checkbox"/>
Manual Guide <i>i</i> with customised screens for quicker programming	✓	<input type="checkbox"/>
Permanent memory (your data is not lost when machine is shut down)	✓	<input type="checkbox"/>
Tool form checking against workpiece (for collision prevention)	✓	<input type="checkbox"/>
RS232 and PCMCIA communications	✓	<input type="checkbox"/>
Industry standard ISO CNC	✓	<input type="checkbox"/>
Load or create CNC programs for other CNC lathes	✓	<input type="checkbox"/>
World-wide after sales support	✓	<input type="checkbox"/>



PO Box 20, Union Street, Heckmondwike,  
West Yorkshire, England WF16 0HN  
Tel: +44 (0)1924 415010 Fax: +44 (0)1924 415011  
www.harrison.co.uk  
mail@harrison.co.uk





# ALPHA XS/XM

## THE WORLD'S BEST MANUAL/CNC LATHE

"I can't imagine why anybody would buy an ordinary lathe with a machine like this on the market"

Graham Barnes, Kendal



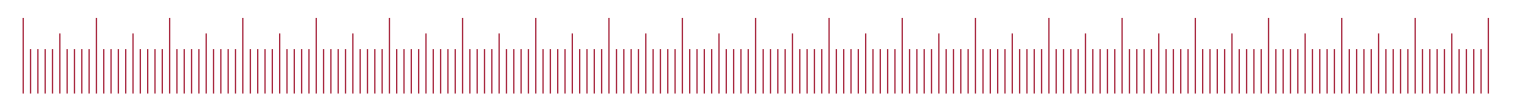
The World's best Manual/CNC Lathe is now even faster, has more power and the very latest and best GE Fanuc total system solution available: servos, spindle, drives, control, operator panel and all electricals.

.....**WITH NO INCREASE IN PRICE!**

Harrison design engineers have added over 85 improvements and enhancements (including a milling facility on the 1550XM) to the World's leading range of Alpha lathes and the result is the **Alpha X Series**.

Alpha X is the perfect partner for sub contractors, toolrooms, R&D and all education and training applications.

Every Alpha X Series lathe is manufactured to Tool Room Standards (DIN 8605) at one of Europe's largest lathe manufacturing plants in Yorkshire, England.



# ALPHA XS/XM

## HIGH PRECISION TURNING APPLICATIONS

The much improved new Alpha XS and XM ranges from Harrison offer a choice of six advanced technology lathes to suit all types of high-precision turning applications. In addition the all new, versatile Alpha 1550 XM has the capability for milling as well as turning. This innovative new machine introduces an important extra dimension, especially for customers who have previously invested in separate lathes and milling machines.

All six new Alpha X Series lathes are perfectly suited to producing detailed and intricate one-offs to the highest standard of finish and accuracy. With their advanced Harrison/Fanuc control and bespoke software systems, they are ideal for turning small-to-medium sized batches with fast, high quality repeatability, excellent accuracy and surface finish and, most importantly of all, lower component production costs.

Alpha quality, plus a wide range of training opportunities, has made Alpha lathes the favourite choice for colleges and training centres around the world. Ideal training features include compatibility with industry standard ISO programs and Harrison's Alphaslink software which enables multi-desk 'live' turning demonstrations to be given on the machines.

**No other lathes on the market today, including full CNC machines can compete with Harrison's Alpha X Series for speed of production when it comes to 'one-offs' and small-batch turned parts.**

### ALPHA X - THE ULTIMATE TURNING MACHINE



- New high performance lathes with 85 improvements
- Greater cutting performance
- Higher spindle speeds with wider ranges
- Faster rapid traverse rates
- Greater spindle torque at low speeds
- Latest Fanuc Beta *i* Series spindle and axis motors
- Up-rated GAMET high-precision bearings
- Independent, sliding operator's console with handy storage tray
- Extra Alpha System features
- Latest Fanuc Manual Guide *i*
- Fast, easy set up - quickest of any lathe on the market
- New style fully enclosed guarding for maximum safety
- Automatic slideway and ballscrew lubrication system
- Optional milling function with FULL C axis

# ALPHA XS/XM

## MARKET LEADING PERFORMANCE

### 'MADE IN QUALITY' - A CENTURY OF EXCELLENCE

Strength, reliability, versatility, ease of operation and accuracy have always been by words for Harrison lathes. This pedigree comes from Harrison's continuous commitment to develop and enhance its world famous lathes. Today, advanced new technologies are integrated into Harrison machines for market leading performance combined with the same build quality and durability. It adds up to a formula for lathe construction, which is second to none.

#### MACHINE BED

Harrison's cutting-edge lathe design and construction quality begins with the machine bed. Alpha beds use high performance cast iron, with a unique 'Warren' type construction for maximum strength and optimum swarf clearance.

In addition, all Alpha lathe beds are mounted on cast-iron plinths to neutralise stress in the machine bed and slideways are hardened and specially ground to ensure high-precision, parallel operation of the lathe at all times.

#### OPERATORS CONSOLE

The newly designed operator's console is located, for optimum operator convenience and efficiency, directly in line-of-sight with the cutting tool. The hand wheels are installed at the ideal ergonomic height for ease of use and have the Alpha's popular "one-click-one-micron" rotational feel sensitivity.

The complete operator's control panel moves on its own independent carriage which allows it to be moved quickly and effortlessly aside during loading and setting up.



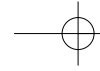
#### DRIVE TRAIN

Into the design and development of all Alpha lathes goes the technical expertise of specialists from Harrison's partner companies, Gamet Bearings and Pratt Burnerd chucking systems.

Their combined research programs ensure that new Alpha X lathes feature the most advanced developments in spindle bearing technology and chuck design. This provides the highest possible spindle speeds and optimum chuck performance for high accuracy turning with maximum load carrying capacity.

#### HEADSTOCK

Crucial to turning precision and quality is the design and capability of the headstock. These lathes have up-rated Fanuc spindle motors for extra power and more torque in all speed ranges. This means that 'bottom end' torque has been increased by up to 76% giving excellent, highly accurate metal-cutting performance at lower speeds. All Alpha X lathes are equipped with all electric, three speed gearboxes enabling the correct gear to be automatically selected by the lathe's control system.



# ALPHA XS/XM

## FANUC 21i TB CONTROL



All Alpha X lathes are fitted with the most advanced control on the market today. It is a customised Fanuc control that gives you the option of manual or automatic operation via a simple key switch. In manual mode, the control employs the latest upgraded version of Harrison's own "Alpha System" which is acclaimed by thousands of Alpha users to be the simplest and most shop floor friendly teach lathe control in the world.

In automatic mode, the full strength of Fanuc's latest technology is brought into play with the Manual Guide *i* programming system.

This conversational system has been completely revamped from previous generations to become an outstandingly powerful and comprehensive conversational programming system.

The combination of these two systems on one machine means that the Alpha X is the most versatile and capable lathe ever produced.

**It will do virtually anything you ask of it!**

- Latest Control Features**
- Ultra high speed 21i TB CNC
  - 10.4" colour touch screen
  - 2 Software systems
    - Harrison "Alpha System"
    - Fanuc Manual Guide *i*
  - Industry standard ISO programming
  - High speed fibre optic data transfer
  - PCMCIA (flash card) and RS232 communication ports
  - Twin MPG handwheels and rapid traverse joystick

# ALPHA XS/XM

## HARRISON ALPHA SYSTEM

**ALPHA SYSTEM** is a unique control software developed by Harrison to enable you to double, treble or even quadruple your productivity compared with other turning methods. The reason our Alpha System is so simple, practical and shop floor friendly is that our engineers are lathe specialists.

Alpha System uses easily recognisable screen graphics along with simple question and answer prompts to guide you. It is also the reason that the Alpha System uses a touch screen, so you can work directly on screen rather than hunt for the right button to press.

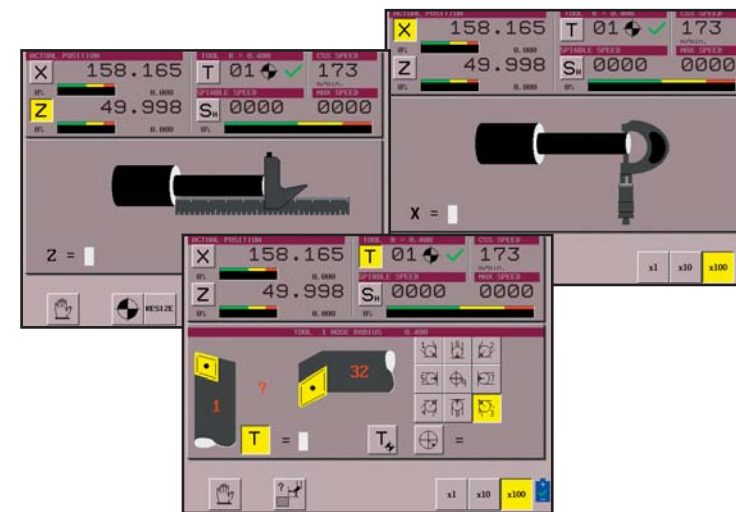
### MANUAL TURNING

Turn the key and you are turning manually. It's as simple as that! The manual screen display shows X and Z positions just like a DRO plus spindle speed, tool number and feed rate.

**Even if you haven't used a lathe since your schooldays you could walk up to an Alpha X now and cut metal.**

### TOOL SETTING

On many lathes tool setting can be a difficult and tedious process. With the Alpha things are different and there is no lathe control on earth that has a simpler tool setting procedure. Just follow the instructions on three screens and the job is done, with the machine automatically calculating offsets and workshifts for you.



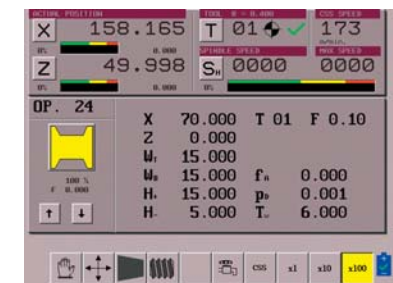
### SEMI-AUTOMATIC TURNING

With the Harrison Alpha System, a wealth of semi automatic machining operations can be performed. These include parallel turning to stop positions, chamfers and radii, tapers, threads, grooves, box cycles and even contour shapes. These can be linked together to produce even the most complex of components quickly and efficiently.

What's more, the easy to understand shop floor language coupled with touch screen simplicity means that a turner can learn to machine parts quickly.

**Most turners will learn to use the Alpha System in less than half a day!**

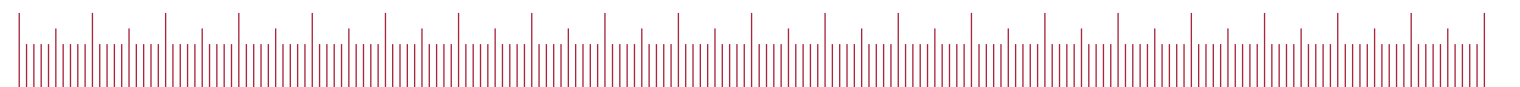
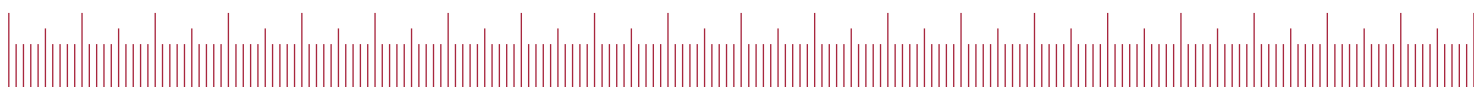
One of the beauties of the Alpha System is that you are always in control of the machine and you can manually override machining at any time to gain confidence or to hit the sweet spot for optimum performance.



### CAD/CAM Machining (AlphaLink Software)

Each Alpha X series lathe is supplied with an AlphaLink offline programming CD as standard. This software can be installed onto your own computer for working in the office or at home, or linking directly to the machine.

Primarily intended to increase the flexibility of the Alpha lathe, AlphaLink provides a simple yet powerful CAD/CAM system for off-line programming, G code outputting and mass storage backup of programmes.

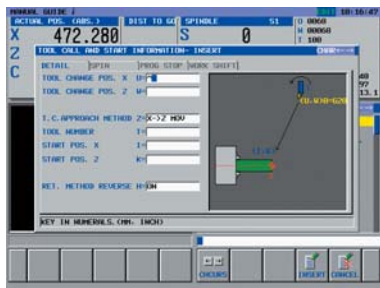


# ALPHA XS/XM

## MANUAL GUIDE *i*

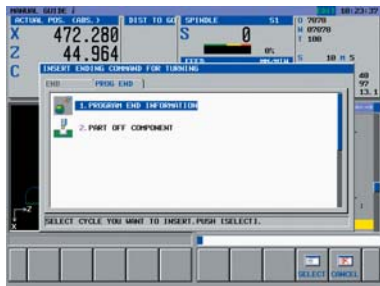
### AUTOMATIC TURNING

Manual Guide *i* is the latest and most powerful conversational programming system from Fanuc. It offers the most comprehensive and feature laden aid that any lathe programmer could want and becomes available on the Alpha X Series when the keyswitch on the control panel is turned to the automatic position.



### CUSTOMISED PAGES

Despite the enormous strength of the Manual Guide *i* system, Harrison's engineers have been able to bring their turning experience into play to develop customised cycles especially for the needs of a manual/CNC type of lathe. These Harrison developed cycles will save you a considerable amount of time and button pushing.



### CREATING A PROGRAMME

1. Select a tool
2. Use Harrison's TOOL CALL AND START page
3. Call up roughing cycle
4. You will be prompted to enter roughing cutting information, speeds, feeds etc.
5. Follow the on screen instructions to draw your part
6. Store this shape as a part programme
7. Use Harrison's toolchange cycle page for finishing tool
8. Call up finishing cycle
9. Enter finish cutting information
10. Call up saved shape (there is no need to re enter shape information for finishing cut)
11. Finally use Harrison's customised cycle to end machining

### SIMULATION AND ANIMATION

Manual Guide *i* has a more powerful graphics package than many commercial CAD/CAM systems. After a programme has been created, a simulated component can be viewed in any direction, or as a 3D model that can be cut or sectioned or magnified to see detail.



This simulated component can then be animated to show the cutting process, the toolpath, metal removal and the finished component to ensure that what you get is what you have programmed and exactly what you want.

### CNC TURNING

The real strength of Manual Guide *i* is that it is effectively a CNC interface. All the time you are working in Manual Guide *i*, the 21*i* TBC is creating a CNC programme in the background. This means that conversion from conversational mode to CNC mode is instant. It also means that you can work in either CNC or conversational mode or even both at the same time. Furthermore it means that industry standard CNC programmes can be loaded into and out of the control at any time.

The Alpha X Series is a powerful conversational lathe that can also run CNC programmes developed elsewhere or to create CNC programmes for use on other machines.

# ALPHA XS/XM

## TOOLING SYSTEMS

### PARAT 4 WAY INDEXING QUICK CHANGE

High accuracy 40 position hand indexing 4 station toolpost with quick change toolholder facility.

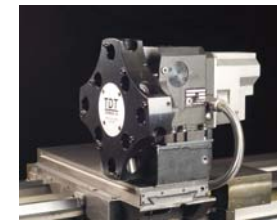
	MODEL	TOOL SECTION	MAX. BORING	MT
		Sq MAX	BAR DIA.	
Alpha 1350XS	Size 1	20	30	1, 2
Alpha 1400XS	Size 2	25	40	3, 4
Alpha 1460XS	Size 2	25	40	3, 4
Alpha 1550XS	Size 2	25	50	3, 4
	Size 3	40	50	3, 4
Alpha 1800XS	Size 3	40	50	3, 4
	Size 4	50	60	4, 5
Alpha 1550XM	Size 2	25	50	3, 4
	Size 3	40	50	3, 4



### AUTOMATIC BI-DIRECTIONAL INDEXING DISC TURRETS

Multi station VDI auto power turret mounted on the front of the cross slide.

	TOOLHOLDER	TOOL SECTION	MAX. BORING	NO. OF STATIONS
	SIZE		BAR DIA.	
Alpha 1350XS	VDI 30	20	32	8
Alpha 1400XS	VDI 30	20	32	8
Alpha 1460XS	VDI 30	20	32	8
Alpha 1550XS	VDI 40	25	40	8
Alpha 1800XS	VDI 50	32	50	8
Alpha 1550XM	VDI 40	25	40	8



## Driven Tooling for 1550XM

### CAPTO TOOLPOST

The Capto toolpost is a totally modular system with quick change, 2 micron repeatability in a range of sizes to suit your application.

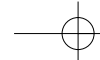
- Internal coolant supply
- 5 sizes (C8 to C3)
- Positive 3 way tooling
- Universal system for turning or milling



### DUPLOMATIC DRIVEN TOOL TURRET

Turret type	Duplomatic BS-DT-16-240
Disc Diameter	(ø)360mm
Tool Holder PCP	4 driven tool stations @ (ø)240mm 4 fixed tool stations @ (ø)289mm
Tool holder type	40VDI
Total no. tools	8
Total no. driven tools	4





# ALPHA XS/XM

## SPECIFICATION

	Alpha 1350XS	Alpha 1400XS	Alpha 1460XS	Alpha 1550XS	Alpha 1800XS-120	Alpha 1800XS-170	Alpha 1550XM
Distance between centres	650mm (25")	1250mm (50")	1500mm (60")	2000mm (80") or 3000mm (120")	2000mm (80"), 3000mm (120") or 4000mm (160")	2000mm (80"), 3000mm (120") or 4000mm (160")	2000mm (80") or 3000mm (120")
Saddle stroke Z-Axis Max	556mm (21 <sup>7</sup> / <sub>8</sub> ")	1156mm (45 <sup>1</sup> / <sub>2</sub> ")	1510mm (60")	2010mm (79 <sup>1</sup> / <sub>8</sub> ")	3020mm (118 <sup>7</sup> / <sub>8</sub> ")	3020mm (118 <sup>7</sup> / <sub>8</sub> ")	2010mm (79 <sup>1</sup> / <sub>8</sub> ")
Swing over bed	350mm (13 <sup>3</sup> / <sub>4</sub> ")	400mm (15 <sup>3</sup> / <sub>4</sub> ")	460mm (18 <sup>3</sup> / <sub>8</sub> ")	554mm (21 <sup>3</sup> / <sub>4</sub> ")	800mm (31 <sup>1</sup> / <sub>2</sub> ")	800mm (31 <sup>1</sup> / <sub>2</sub> ")	554mm (21 <sup>3</sup> / <sub>4</sub> ")
Swing in gap	535mm (21")	585mm (23")	730mm (28 <sup>3</sup> / <sub>4</sub> ")	830mm (32 <sup>5</sup> / <sub>8</sub> ")	870mm (34 <sup>1</sup> / <sub>4</sub> ")	870mm (34 <sup>1</sup> / <sub>4</sub> ")	830mm (32 <sup>5</sup> / <sub>8</sub> ")
Gap width from faceplate	165mm (6 <sup>1</sup> / <sub>2</sub> ")	165mm (6 <sup>1</sup> / <sub>2</sub> ")	216mm (8 <sup>1</sup> / <sub>2</sub> ")	216mm (8 <sup>1</sup> / <sub>2</sub> ")	340mm (13 <sup>3</sup> / <sub>8</sub> ")	340mm (13 <sup>3</sup> / <sub>8</sub> ")	216mm (8 <sup>1</sup> / <sub>2</sub> ")
Swing over cross-slide	196mm (7 <sup>3</sup> / <sub>4</sub> ")	246mm (9 <sup>5</sup> / <sub>8</sub> ")	270mm (10 <sup>5</sup> / <sub>8</sub> ")	370mm (14 <sup>1</sup> / <sub>2</sub> ")	520mm (20 <sup>1</sup> / <sub>2</sub> ")	520mm (20 <sup>1</sup> / <sub>2</sub> ")	370mm (14 <sup>1</sup> / <sub>2</sub> ")
Spindle bore	42mm (1 <sup>5</sup> / <sub>8</sub> ")	55mm (2 <sup>1</sup> / <sub>8</sub> ")	78mm (3 <sup>1</sup> / <sub>8</sub> ")	104mm (4 <sup>1</sup> / <sub>8</sub> ")	120mm (4 <sup>3</sup> / <sub>4</sub> ")	170mm (6 <sup>3</sup> / <sub>4</sub> ")	104mm (4 <sup>1</sup> / <sub>8</sub> ")
Spindle nose	Camlock D1-4"	Camlock D1-6"	Camlock D1-8"	Camlock D1-11"	Camlock D1-11"	A2-11"	Camlock D1-11"
Taper in nose bush	No. 3 MT	No. 4 MT	No. 5 MT	No. 5 MT	N/A	N/A	No. 5 MT
Spindle speeds: Low range	1 to 366rpm	1 to 297rpm	1 to 247rpm	1 to 224rpm	15 to 611rpm	10 to 407rpm	1 to 224rpm
Medium range	1 to 1088rpm	1 to 861rpm	1 to 740rpm	1 to 672rpm	N/A	N/A	1 to 672rpm
High range	1 to 3500rpm	1 to 2700rpm	1 to 2200rpm	1 to 2000rpm	40 to 1500rpm	25 to 1000rpm	1 to 2000rpm
Main motor	7.5kW (10HP)	7.5kW (10HP)	11kW (15HP)	11kW (15HP)	26kW (35HP)	26kW (35HP)	11kW (15HP)
Constant power range	86-3500rpm	69-2700rpm	67-2200rpm	64-1970rpm	153-1500rpm	102-1000rpm	64-1970rpm
Tailstock quill travel	140mm (5 <sup>3</sup> / <sub>4</sub> ")	140mm (5 <sup>1</sup> / <sub>2</sub> ")	145mm (5 <sup>5</sup> / <sub>8</sub> ")	145mm (5 <sup>5</sup> / <sub>8</sub> ")	210mm (8 <sup>1</sup> / <sub>4</sub> ")	210mm (8 <sup>1</sup> / <sub>4</sub> ")	145mm (5 <sup>5</sup> / <sub>8</sub> ")
Tailstock quill diameter	63mm (2 <sup>1</sup> / <sub>2</sub> ")	73mm (2 <sup>7</sup> / <sub>8</sub> ")	95mm (3 <sup>3</sup> / <sub>4</sub> ")	95mm (3 <sup>3</sup> / <sub>4</sub> ")	120mm (4 <sup>3</sup> / <sub>4</sub> ")	120mm (4 <sup>3</sup> / <sub>4</sub> ")	95mm (3 <sup>3</sup> / <sub>4</sub> ")
Tailstock taper	No. 4 MT	No. 5 MT	No. 6 MT	No. 6 MT	No. 6 MT	No. 6 MT	No. 6 MT
Electrical supply required	22kVA	22kVA	24kVA	24kVA	32kVA	32kVA	24kVA
Floor to spindle centre	1061mm (41")	1086mm (42")	1145mm (44 <sup>3</sup> / <sub>4</sub> ")	1195mm (46 <sup>3</sup> / <sub>4</sub> ")	1200mm (48")	1200mm (47 <sup>1</sup> / <sub>4</sub> ")	1195mm (46 <sup>3</sup> / <sub>4</sub> ")
Overall length	2400mm (74 <sup>3</sup> / <sub>4</sub> ")	2900mm (101")	1500mm (60") 3710mm (146")	2000mm (80") 4100mm (166") 3000mm (120") 5100mm (206")	2000mm (80") 4210mm (166") 3000mm (120") 5210mm (206") 4000mm (160") 6210mm (246")	2000mm (80") 4210mm (166") 3000mm (120") 5210mm (206") 4000mm (160") 6210mm (246")	2000mm (80") 4100mm (166") 3000mm (120") 5100mm (206")
Overall width	1700mm (67")	1700mm (67")	2000mm (78 <sup>3</sup> / <sub>4</sub> ")	2000mm (78 <sup>3</sup> / <sub>4</sub> ")	2000mm (78 <sup>3</sup> / <sub>4</sub> ")	2000mm (78 <sup>3</sup> / <sub>4</sub> ")	2000mm (78 <sup>3</sup> / <sub>4</sub> ")
Overall height	1500mm (59")	1500mm (59")	1750mm (69")	1750mm (69")	1910mm (75")	1910mm (75")	1750mm (69")
Overall weight (nett)	1800kg	2200kg	3200kg	3600kg/4000kg	5500kg/6200kg/6900kg	5500kg/6200kg/6900kg	3600kg/4000kg

ILLUSTRATIONS AND SPECIFICATIONS ARE NOT BINDING IN DETAIL.  
WORKPIECE CAPACITY AND MACHINABLE LENGTHS AND DIAMETERS WILL VARY  
NOT ALL THE FEATURES DESCRIBED IN THE

THE DESIGNS ARE SUBJECT TO MODIFICATION AND IMPROVEMENT WITHOUT NOTICE  
AND MAY BE REDUCED BELOW MAXIMUM DEPENDING ON WORKHOLD AND TOOLING USED  
BROCHURE ARE RELEVANT TO ALL MACHINES IN THE RANGE

C-Axis	
Motor max torque	4Nm
Output max torque	152Nm
Max output speed	105rpm
Resolution	0.001°

### STANDARD MACHINE ACCESSORIES

- CE Regulated electrically interlocked machine guarding
- Stainless steel ballscrew cover
- Alphaslink CAD/CAM for windows
- Rapid traverse joystick
- Machine work light
- Electric coolant system
- AlphaLink instruction disc
- Hands-on tutorial disc
- Gamet ABEC 9 equivalent super high precision taper roller bearings
- Operation and spare parts disc
- Accuracy charts
- Wheeled swarf bin
- Automatic control oil pump slideways and ballscrew lubrication
- Automatic external oil pump headstock lubrication

### MACHINE OPTIONS

- Superior precision manual 3 & 4 jaw chucks and hydraulically operated 3 jaw chucks from Pratt Burnerd International
- Range of Crawford collets
- Range of fixed and travelling steadies
- Rotating centres
- Choice of manual or automatic tooling systems
- Workholding faceplate with guard
- Work driver plate
- High pressure coolant system
- External floor mounted transformer

### CNC STANDARD ACCESSORIES

- 10.4" (264mm) LCD colour touchscreen
- MDI keyboard
- G10 offset value setting
- Graphic display
- PCMCIA data interface
- Manual handles X & Z axis
- 32 pairs of tool offsets
- Tool wear/geometry offsets
- G code systems A, B, C
- Chamfering and corner radiusing
- Thread cutting retract
- Background editing
- Constant surface speed
- Canned drilling cycles
- Multi-repetitive cycles type I and II
- RS 232 interface
- Continuous thread cutting
- Rigid tapping
- Custom Macro B
- Inch/Metric Conversion

### CNC OPTIONS

- Variable lead threading
- Additional part program memory 128k
- Stored stroke limit
- Direct drawing program
- Hours run/part count display
- Thread cutting retract
- Ethernet

