

QUICK TURN UNIVERSAL SERIES

SIMPLE BUT INNOVATIVE

With our QUICK TURN UNIVERSAL (QTU) Series of CNC turning centers, we have forever changed high-volume small parts production. These machines, while basic in their design, feature innovative technologies that bring high productivity, precision and value to job shops as well as first and second tier automotive suppliers.

The QTU Series offers everything from 2-axis turning to Multi-Tasking solutions with automation. Plus, all of the machines have small footprints with built-in multi-tap transformers to save shops valuable floor space. In terms of workpiece size, the Series currently handles maximum part diameters that range from 13.5" to 16.25".

Such a diverse machine selection also makes it easy to find the perfect technology balance for your manufacturing needs at the lowest possible operating costs, whether you are producing medical devices from aluminum, engine parts from cast iron or electronic enclosures from steel.



QUICK TURN UNIVERSAL 250M

UNMATCHED PRICE-PERFORMANCE RATIO

Our QTU Series redefines the quality and productivity standards of value-based turning centers and simple Multi-Tasking machines. By innovating the basic elements of a horizontal lathe, we have made it possible for more manufacturers to be able to afford our world-class technology.

- Diverse machine lineup fulfills virtually every small parts turning and milling need
- Second turning spindles add DONE IN ONE® part processing
- Milling turrets with rotary tool spindles provide Multi-Tasking capability
- Y-axis functionality offers movement above and below centerline
- Integral spindle/motor headstocks provide high power and stability
- Integrated direct-drive C-axis offers high-speed, high-accuracy positioning and contouring
- New turret design with integral hydraulic clamp system provides maximum rigidity
- Servo-driven, programmable NC tailstocks yield high productivity levels
- New bed design with low center of gravity supports heavy cutting performance
- Large swing capacity exceeds any competitive product in this class
- Efficient, ergonomic design provides operator convenience and lowers power consumption
- Advanced CNC technology offers easy programming and optimized performance
- Easily integrates with various forms of automation to achieve even higher productivity levels

MACHINE CONFIGURATIONS

- | | |
|--------------|--------------|
| ■ QTU 250 | ■ QTU 350 |
| ■ QTU 250M | ■ QTU 350M |
| ■ QTU 250MY | ■ QTU 350MY |
| ■ QTU 250MS | ■ QTU 350MS |
| ■ QTU 250MSY | ■ QTU 350MSY |

M = Upper Turret with Rotary Milling

S = Second Spindle

Y = Y-Axis Capability

* QTU 200 machines for smaller part diameters coming soon.



QUICK TURN UNIVERSAL 350MY + GR100 GANTRY LOADER

DONE IN ONE OPERATIONS

SECOND TURNING SPINDLES

QTU machines with an "S" designation feature second turning spindles that greatly increase productivity and decrease the cost per part. The added spindle will automatically transfer parts from one chuck to another for secondary operations, which reduces part handling. Part transfer capabilities also allow the machines to process workpieces on both faces or sides via secondary operations such as drilling and tapping.



POWERFUL PERFORMANCE

INTEGRAL SPINDLE/MOTOR HEADSTOCKS

While most competitive products employ a belt and drive spindle structure, QTU machines rely on a far superior built-in spindle/motor headstock design that eliminates vibration and provides high reliability. Furthermore, the full-circumference C-axis headstock brake design on QTU machines with Y-axis capability provides high-accuracy spindle positioning to within 0.0001°.

Each headstock gets its power from a variable-speed AC inverter, which eliminates the need for belts and a pulley and provides you with higher machining accuracy in terms of part roundness and finish. QTU spindles are also virtually maintenance free and promote energy efficiency.



MULTI-TASKING CAPABILITY

ROTARY TOOL SPINDLES

QTU machines with an "M" designation come with a rotary tool spindle that performs milling, drilling and tapping operations, making it possible to complete several processes in a single machine cycle. Plus, only having to set up one machine to process a workpiece complete results in improved accuracy and a significant time savings for small-to-medium lot sizes.



TOOLING VERSATILITY

INNOVATIVE TURRET DESIGN

The new turret design on the QTU machines offers multiple tool configurations with easy changeover. The turret uses a roller gear cam drive system to achieve smooth high-speed, high-accuracy indexing motion as well as eliminate the need for expensive curvic/index couplings.

Without these couplings, it is possible to expand the turret to include up to 24 tools as well as program an infinite number of index positions without having to make any changes on the turret housing. Furthermore, this new turret design features an integral hydraulic clamp system to provide maximum rigidity for an overall superior cutting performance.

CENTERLINE MACHINING

Y-AXIS TURRET MOTION

The rigid, precise Y-axis turret motion on the QTU "Y" machine configurations is made possible via a double-slide construction that easily withstands strong cutting forces. Other Y-axis benefits include keyway finishing, off-centerline O.D. drilling and additional tool capacity.



FASTER SETUP

NC SERVO-DRIVEN TAILSTOCKS

Each QTU machine has a fully programmable NC servo-driven tailstock that significantly reduces setup times. Through the part program, the tailstock retracts to a known position and its center makes contact with the part with consistent holding pressure. Because of its positive independent drive system, the tailstock can drill holes on a shaft centerline, which adds versatility to the jobs it can process.

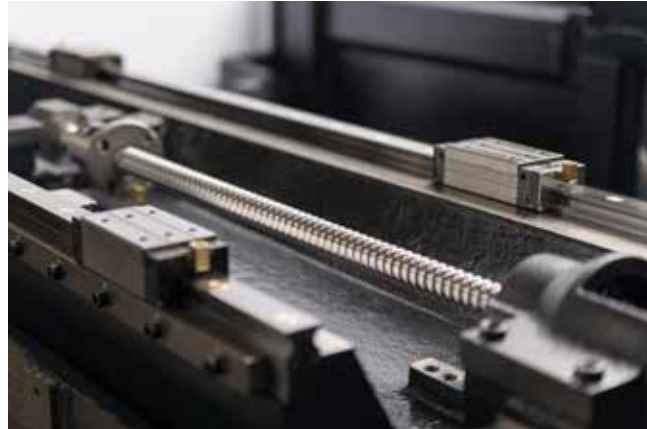


RIGID, DURABLE PERFORMANCE

NEW BED DESIGN

QTU machines are available in 20" bed lengths and feature a new bed design with a low center of gravity. Pair this with our exclusive MX Hybrid Roller Guide System and you can sustain accurate cutting performance in heavy material removal applications.

The MX Hybrid Roller Guide System delivers levels of durability and reliability that result in long-term accuracy. It dampens vibration to extend tool life, handles higher load capacities as well as accelerates and decelerates faster to shorten cycle times.



LARGE CAPACITY, LESS INTERFERENCE

UNMATCHED SWING DIAMETER

QTU machines offer a maximum swing diameter of 27.4" over the machine bed, an impressive specification you will not find on other turning centers in this class. The maximum turning diameter for the 2-axis QTU 250 and 350 machines is 16.25", while all of the other machines have a maximum turning diameter of 13.5".

ENHANCED ERGONOMICS

IMPROVED WORKPIECE MONITORING, LESS MAINTENANCE

Driven to further increase the convenience of our products, we took a fresh approach when it came to the ergonomics of our QTU machines. Machine windows are large and interior lighting is bright to provide quick, easy visual access to the work areas during cutting operations.

We also designed our QTU machines to simplify routine maintenance. Items that require daily checking, such as lubrication levels and hydraulic pressure units, are conveniently located in one spot. Furthermore, the one-piece way cover on these machines provides improved chip flow and reduces maintenance downtime.



ECO-FRIENDLY COMPONENTS

EFFICIENT LED LIGHTING, AUTOMATIC SHUTOFF

QTU machines come with several energy efficient features including LED work lights that have lower electrical power consumption and a service life that is 10 times longer than conventional fluorescent lamps.

These lights automatically shut off after a predetermined period of time. When the personnel sensors on our machines detect nearby movement, these lights automatically turn back on. Our CNC displays and optional chip conveyors also feature automatic shutoff.

SMALL FOOTPRINTS

SAVE VALUABLE FLOOR SPACE

QTU machines feature small footprints that keep manufacturers from having to sacrifice valuable floor space in order to achieve high productivity levels.

To further minimize the amount of floor space these machines take up, we outfitted them with built-in multi-tap transformers. An integrated transformer also reduces the electric noise that can sometimes be problematic to a machine's CNC.



OPTIMIZED MULTI-TASKING PROGRAMMING MATRIX NEXUS 2 CNC

- QUICK TURN UNIVERSAL 250MY
- QUICK TURN UNIVERSAL 250MS
- QUICK TURN UNIVERSAL 250MSY
- QUICK TURN UNIVERSAL 350MY
- QUICK TURN UNIVERSAL 350MS
- QUICK TURN UNIVERSAL 350MSY

The MATRIX NEXUS 2 CNC simplifies Multi-Tasking operations for parts requiring off-centerline machining and angled drilling, milling or tapping. With unequalled innovation for conversational programming, the control incorporates a wide variety of advanced features for increased productivity through high-speed, high-accuracy machining as well as ease of operation.

HARDWARE

- Simultaneous control of up to 3 axes and continuous control of second spindles
- A 20GB hard disk offers increased program storage capacity
- High-speed CPU and large 12.1" CNC display supports multiple functions
- EIA/ISO and conversational programming offers versatility and user-friendly operation
- Sub-micron input and nano control delivers high-accuracy machining

SOFTWARE

- Intelligent Thermal Shield provides heat displacement control for improved stability
- Active Vibration Control reduces vibration for high-accuracy positioning
- Intelligent Safety Shield offers safe operation during machine setup and manual operation
- Mazak Voice Adviser provides verbal support for machine setup and safety
- SMART Functions streamline data entry and reduce programming time
- Virtual machining provides convenient program and interference checks



EASY PROGRAMMING, FAST JOB SETUP SMART CNC

- QUICK TURN UNIVERSAL 250
- QUICK TURN UNIVERSAL 250M
- QUICK TURN UNIVERSAL 350
- QUICK TURN UNIVERSAL 350M

The SMART CNC makes it possible for inexperienced operators to quickly and easily develop machining programs as well as achieve fast job setup. Programming time is 75 percent faster when compared with machines using EIA/ISO systems, which is especially effective when machining basic workpiece geometries that require simple turning, milling, drilling and tapping operations.

HARDWARE

- Control of up to 4 axes and 2 spindles
- EIA/ISO and conversational programming for versatility and user-friendly operation
- Accommodates up to 512 programs
- Capacity for 128 tool offset groups, 54 work offset groups and 500 alarm histories
- QWERTY keyboard provides same data input method as a PC

SOFTWARE

- Intelligent Thermal Shield provides heat displacement control for improved stability
- Intelligent Maintenance Support prevents unexpected machine downtime
- SMART menu keys minimize required programming screens and key presses



COMPLETE TURNKEY SYSTEMS

EASY AUTOMATION INTEGRATION

We understand the significant competitive advantages that come with having the right type of automation for your manufacturing facility.

We designed the QTU machines to easily integrate with different levels of automation, including bar feeders, gantry loaders and robots for unsupervised loading and unloading of workpieces.

You can also reduce operator part handling by using an automated parts catcher with a QTU machine. The catcher accepts parts that have been parted off at the spindle and loads them onto the conveyor that moves them to the exterior of the machine.

For QTU machines performing heavy metal-removal operations, our high-pressure Super Flow coolant system allows for efficient chip evacuation.



QUICK CHANGEOVERS

GR100 SERIES GANTRY LOADERS

Our GR100 gantry loaders represent a simple, affordable way to automate parts loading on our QTU machines. These loaders, which offer quick changeover times, also bring speed and accuracy to shops experiencing an upswing in high-volume jobs.



Two-Position Hand with Three-Jaw Chuck

Made for use with the QTU 250 and 350 2-axis models as well as those with the "M" and "MY" designations, our GR100 gantry loaders with two-position hands and three-jaw chuck grippers accommodate parts up to 7.09" in diameter, 4.92" in length and up to 11 lb x 2.

Three-Position Hand with Three-Jaw Chuck

Made for use with the QTU 250 and 350 models featuring the "MS" and "MSY" designations, our GR100 gantry loaders with three-position hands and three-jaw chuck grippers accommodate parts up to 7.09" in diameter, 3.94" in length and up to 11 lb x 2.

Conveyor Types

Each GR100 gantry loader comes standard with a pitch feed workpiece conveyor system where pallets move from the rear to the front of the conveyor, and the robot arm picks up the workpieces from their pallets in order.

An optional two-pallet changer makes continuous part production possible. Operators can load parts on one pallet, while the gantry loader services the other.



BAR FEEDER



GANTRY LOADER



PALLETECH SYSTEM



ARTICULATED ROBOT

OUR CUSTOMIZED APPROACH

Having installed countless, highly effective automation systems for manufacturers across North America, we have the experience and expertise to envision, design and implement an automation system that will boost your shop's productivity and overall bottom line.

Through our own capabilities and partnerships with other industry leaders, we can provide you with a tailored automation solution that fits your unique needs, whether it involves a bar feeder, gantry loader, articulated robot, PALLETECH System or all of the above.

Our expert applications engineers will also help you create and implement software solutions that will ensure maximum return on your automation investment, from user interfaces to scheduling functions to production monitoring.

Prior to the design and implementation of your automation solution, we evaluate its impact on your entire operation by performing:

- Time studies of processes,
- Custom demonstrations to evaluate effectiveness,
- Integral machining simulations,
- Complete process simulations,
- Cutting, workholding and CAD/CAM evaluations, and
- Risk assessments to ensure a safe working environment.

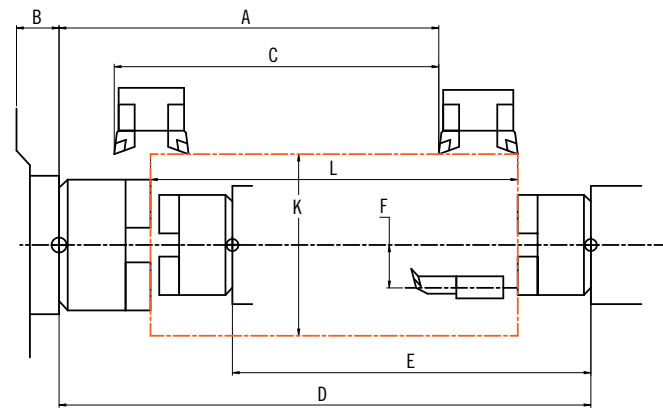


MACHINE SPECIFICATIONS

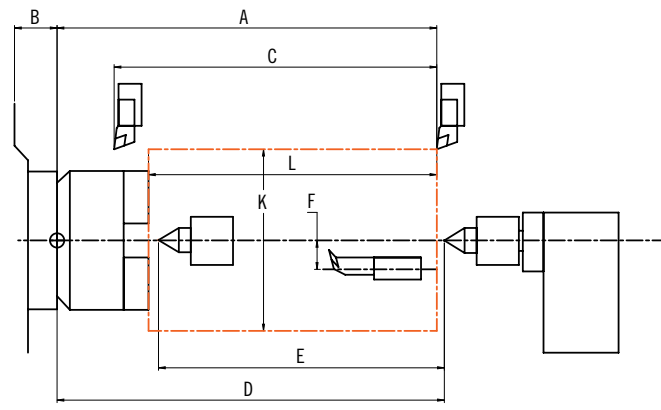
		QUICK TURN UNIVERSAL 250	QUICK TURN UNIVERSAL 350	QUICK TURN UNIVERSAL 250M	QUICK TURN UNIVERSAL 350M
Bed Length		20 in / 500 mm	20 in / 500 mm	20 in / 500 mm	20 in / 500 mm
Capacity	Maximum Swing	27.40 in / 695 mm	27.40 in / 695 mm	27.4 in / 695 mm	27.4 in / 695 mm
	Maximum Machining Diameter	16.25 in / 410 mm	16.25 in / 410 mm	13.5 in / 340 mm	13.5 in / 340 mm
	Maximum Bar Work Capacity (dependent on chuck system)	2.00 in / 51 mm	3.00 in / 76 mm	2.00 in / 51 mm	3.00 in / 76 mm
	Maximum Machining Length	23.66 in / 598 mm	23.23 in / 562.5 mm	21.03 in / 532 mm	19.60 in / 496.5 mm
Main Spindle	Chuck Size	8	10	8	10
	Maximum Speed	4,500 rpm	3,500 rpm	4,500 rpm	3,500 rpm
	Motor Output (minute rating)	20 hp / 15 kW	20 hp / 15 kW	20 hp / 15 kW	20 hp / 15 kW
Second Spindle	Chuck Size	N/A	N/A	N/A	N/A
	Maximum Speed	N/A	N/A	N/A	N/A
	Motor Output (minute rating)	N/A	N/A	N/A	N/A
Turret	Number of Tools	12	12	12	12
	Mill Spindle Maximum Speed	N/A	N/A	4,500 rpm	4,500 rpm
	Mill Spindle Motor Output (minute rating)	N/A	N/A	5 hp / 3.7 kW	5 hp / 3.7 kW
Rotary Axis	Main Spindle Indexing Increment (C-axis)	0.0001°	0.0001°	0.0001°	0.0001°
	Second Spindle Indexing Increment (C-axis)	N/A	N/A	N/A	N/A
Feed Axes	Travel (X-axis)	8.50 in / 215 mm	8.50 in / 215 mm	8.50 in / 215 mm	8.50 in / 215 mm
	Travel (Y-axis)	N/A	N/A	N/A	N/A
	Travel (Z-axis)	24.62 in / 635 mm	24.62 in / 635 mm	23.75 in / 605 mm	23.75 in / 605 mm
	Travel (W-axis)	N/A	N/A	N/A	N/A

	QUICK TURN UNIVERSAL 250MY	QUICK TURN UNIVERSAL 350MY	QUICK TURN UNIVERSAL 250MS	QUICK TURN UNIVERSAL 350MS	QUICK TURN UNIVERSAL 250MSY	QUICK TURN UNIVERSAL 350MSY
	20 in / 500 mm	20 in / 500 mm	20 in / 500 mm	20 in / 500 mm	20 in / 500 mm	20 in / 500 mm
	27.4 in / 695 mm	27.4 in / 695 mm	27.4 in / 695 mm	27.4 in / 695 mm	27.4 in / 695 mm	27.4 in / 695 mm
	13.5 in / 340 mm	13.5 in / 340 mm	13.5 in / 340 mm	13.5 in / 340 mm	13.5 in / 340 mm	13.5 in / 340 mm
	2.00 in / 51 mm	3.00 in / 76 mm	2.00 in / 51 mm	3.00 in / 76 mm	2.00 in / 51 mm	3.00 in / 76 mm
	21.03 in / 532 mm	19.60 in / 496.5 mm	22.69 in / 575 mm	19.60 in / 496.5 mm	22.69 in / 575 mm	19.60 in / 496.5 mm
	8	10	8	10	8	10
	4,500 rpm	3,500 rpm	4,500 rpm	3,500 rpm	4,500 rpm	3,500 rpm
	20 hp / 15 kW	20 hp / 15 kW	20 hp / 15 kW	20 hp / 15 kW	20 hp / 15 kW	20 hp / 15 kW
	N/A	N/A	6	6	6	6
	N/A	N/A	6,000 rpm	6,000 rpm	6,000 rpm	6,000 rpm
	N/A	N/A	10 hp / 7.5 kW	10 hp / 7.5 kW	10 hp / 7.5 kW	10 hp / 7.5 kW
	12	12	12	12	12	12
	4,500 rpm	4,500 rpm	4,500 rpm	4,500 rpm	4,500 rpm	4,500 rpm
	5 hp / 3.7 kW	5 hp / 3.5 kW	5 hp / 3.7 kW	5 hp / 3.7 kW	5 hp / 3.7 kW	5 hp / 3.7 kW
	0.0001°	0.0001°	0.0001°	0.0001°	0.0001°	0.0001°
	N/A	N/A	0.0001°	0.0001°	0.0001°	0.0001°
	8.50 in / 215 mm	8.50 in / 215 mm	8.50 in / 215 mm	8.50 in / 215 mm	8.50 in / 215 mm	8.50 in / 215 mm
	4.00 in / 100 mm	4.00 in / 100 mm	N/A	N/A	4.00 in / 100 mm	4.00 in / 100 mm
	23.75 in / 605 mm	23.75 in / 605 mm	23.75 in / 605 mm	23.75 in / 605 mm	23.75 in / 605 mm	23.75 in / 605 mm
	N/A	N/A	23.00 in / 565 mm	23.00 in / 565 mm	23.00 in / 565 mm	23.00 in / 565 mm

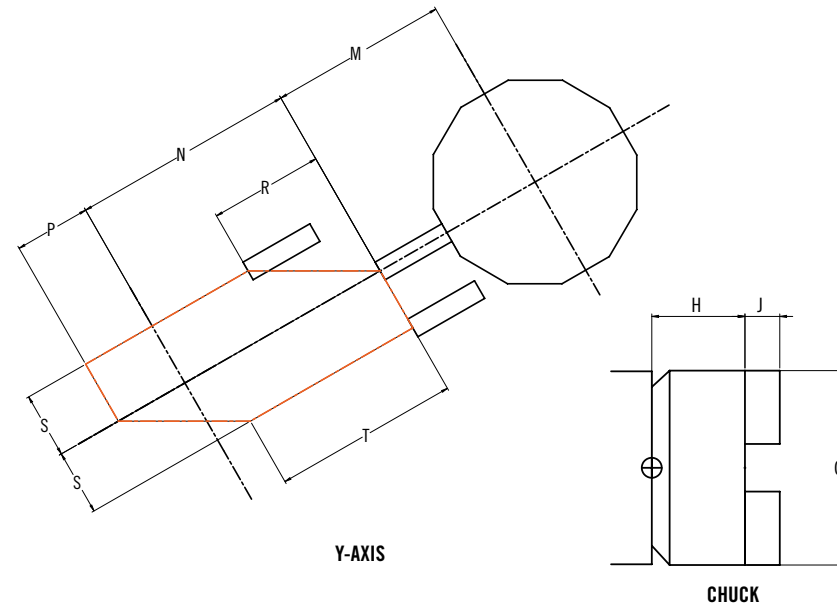
MACHINE SPECIFICATIONS



SECOND SPINDLE



TAILSTOCK



Y-AXIS

CHUCK

CHUCK REFERENCE TABLE						
REFERENCE NUMBER	DIAMETER		SPINDLE FACE TO CHUCK FACE		CHUCK JAW	
	G		H		I	
	in	mm	in	mm	in	mm
1	5.0	127.0	3.7	94.0	1.0	26.0
2	6.0	152.4	3.6	91.0	1.1	29.0
3	6.0	152.4	4.6	117.0	1.1	29.0
4	8.0	203.2	4.1	103.0	1.5	39.0
5	8.0	203.2	4.4	111.0	1.5	39.0
6	10.0	254.0	4.7	120.0	1.7	43.0
7	10.0	254.0	4.5	113.0	1.7	43.0
8	12.0	304.8	4.8	122.0	2.0	51.0

MACHINE MODEL	CHUCK SIZE	BED LENGTH	TOOL TO PRIMARY SPINDLE FACE		SPINDLE FACE TO MACHINE FACE		MAX TOOL TRAVEL		SPINDLE TO TAILSTOCK/2ND SPINDLE		2ND SPINDLE/ TAILSTOCK TRAVEL		TOOL DISTANCE PAST CENTER		MAX WORKPIECE DIAMETER	
			A		B		C		D		E		F		K	
			in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
QTU 200	A2-6 (6/8")	300U	20.2	512.0	1.8	44.7	15.6	395.0	20.0	507.7	13.2	340.0	0.8	20.0	16.2	410.0
	A2-6 (6/8")	500U	29.0	736.0	1.8	44.7	24.4	620.0	28.8	731.7	22.1	565.0	0.8	20.0	16.2	410.0
QTU 250	A2-6 (8")	500U	29.1	740.0	1.6	40.7	24.4	620.0	29.0	735.7	22.1	565.0	0.8	20.0	16.2	410.0
	A2-6 (10")	500U	29.1	740.0	1.6	40.7	24.4	620.0	29.0	735.7	22.1	565.0	0.8	20.0	16.2	410.0
QTU 350	A2-8 (10/12")	500U	28.3	718.5	2.5	62.2	24.4	620.0	28.0	714.2	22.1	565.0	0.8	20.0	16.2	410.0
QTU 200M	A2-6 (6/8")	300U	17.6	446.0	1.8	44.7	14.8	375.0	20.0	507.7	13.2	340.0	1.6	40.0	13.4	340.0
	A2-6 (6/8")	500U	26.4	670.0	1.8	44.7	23.6	600.0	28.8	731.7	22.1	565.0	1.6	40.0	13.4	340.0
QTU 250M	A2-6 (8")	500U	26.5	674.0	1.6	40.7	23.6	600.0	29.0	735.7	22.1	565.0	1.6	40.0	13.4	340.0
	A2-6 (10")	500U	26.5	674.0	1.6	40.7	23.6	600.0	29.0	735.7	22.1	565.0	1.6	40.0	13.4	340.0
QTU 350M	A2-8 (10/12")	500U	25.7	652.5	2.5	62.2	23.6	600.0	28.0	714.2	22.1	565.0	1.6	40.0	13.4	340.0
QTU 200MY	A2-6 (6/8")	500U	17.6	446.0	1.8	44.7	14.8	375.0	20.0	507.7	13.2	340.0	1.6	40.0	13.4	340.0
	A2-6 (6/8")	500U	26.4	670.0	1.8	44.7	23.6	600.0	28.8	731.7	22.1	565.0	1.6	40.0	13.4	340.0
QTU 250MY	A2-6 (8")	500U	26.5	674.0	1.6	40.7	23.6	600.0	29.0	735.7	22.1	565.0	1.6	40.0	13.4	340.0
	A2-6 (10")	500U	26.4	674.0	1.6	40.7	23.6	600.0	28.8	732.2	22.1	565.0	1.6	40.0	13.4	340.0
QTU 350MY	A2-8 (10/12")	500U	25.7	652.5	2.5	62.2	17.8	600.0	28.0	714.2	22.1	565.0	1.6	40.0	13.4	340.0
QTU 200MS	A2-6 (6/8")	500U	20.6	525.0	1.8	44.7	17.8	455.0	32.8	833.0	22.8	580.0	1.5	35.0	13.4	340.0
QTU 250MS	A2-6 (8")	500U	20.8	529.0	1.6	40.7	17.8	455.0	33.0	837.0	22.8	580.0	1.5	35.0	13.4	340.0
	A2-6 (10")	500U	20.8	529.0	1.6	40.7	17.8	455.0	33.0	837.0	22.8	580.0	1.5	35.0	13.4	340.0
QTU 350MS	A2-8 (10/12")	500U	20.0	507.5	2.5	62.2	17.8	455.0	32.1	815.5	22.8	580.0	1.5	35.0	13.4	340.0
QTU 200MSY	A2-6 (6/8")	500U	20.6	525.0	1.8	44.7	17.8	455.0	32.8	833.0	22.8	580.0	1.5	35.0	13.4	340.0
QTU 250MSY	A2-6 (8")	500U	20.8	529.0	1.6	40.7	17.8	455.0	33.0	837.0	22.8	580.0	1.5	35.0	13.4	340.0
	A2-6 (10")	500U	20.8	529.0	1.6	40.7	17.8	455.0	33.0	837.0	22.8	580.0	1.5	35.0	13.4	340.0
QTU 350MSY	A2-8 (10/12")	500U	20.0	507.5	2.5	62.2	17.8	455.0	32.1	815.5	22.8	580.0	1.5	35.0	13.4	340.0

MAX WORKPIECE LENGTH		PRIMARY CHUCK REF. NUMBER		2ND CHUCK REF. NUMBER		TURRET CENTER TO TOOL TIP		TOOL TIP TO SPINDLE CENTER		TOOL TIP PAST SPINDLE CENTER		TOOL TRAVEL		POSITIVE/ NEGATIVE Y-STROKE		TOOL TRAVEL	
L						M		N		P		R		S		T	
in	mm					in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
14.6	370.0	3	4														
23.4	594.0	3	4														
23.6	598.0	4	5														
22.8	577.0	6															
22.2	562.5	7	8														
12.0	304.0	3	4														
20.4	528.0	3	4														
21.0	532.0	4	5														
20.2	511.0	6															
19.6	496.5	7	8														
12.0	304.0	3	4			11.4	290.0	6.1	155.0	2.4	60.0	3.4	86.6	2.0	50.0	5.1	128.4
20.7	528.0	3	4			11.4	290.0	6.1	155.0	2.4	60.0	3.4	86.6	2.0	50.0	5.1	128.4
21.0	532.0	4	5			11.4	290.0	6.1	155.0	2.4	60.0	3.4	86.6	2.0	50.0	5.1	128.4
20.2	511.0	6	7			11.4	290.0	6.1	155.0	2.4	60.0	3.4	86.6	2.0	50.0	5.1	128.4
19.5	496.5	7	8			11.4	290.0	6.1	155.0	2.4	60.0	3.4	86.6	2.0	50.0	5.1	128.4
22.4	567.0	3	4	1													
22.6	575.0	4	5	2													
21.8	554.0	6		2													
21.2	539.5	7	8	2													
22.4	567.0	3	4	1	11.4	290.0	6.1	155.0	2.4	60.0	3.4	86.6	2.0	50.0	5.1	128.4	
22.6	575.0	4	5	2	11.4	290.0	6.1	155.0	2.4	60.0	3.4	86.6	2.0	50.0	5.1	128.4	
21.8	554.0	6		2	11.4	290.0	6.1	155.0	2.4	60.0	3.4	86.6	2.0	50.0	5.1	128.4	
21.2	539.5	7	8	2	11.4	290.0	6.1	155.0	2.4	60.0	3.4	86.6	2.0	50.0	5.1	128.4	

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