

MultiCam[®]

CNC Cutting Solutions

Features & Specifications Guide for MultiCam 3000 Series CNC Plasma

High Performance... ...Affordable Price!

The MultiCam 3000 Series Plasma is the perfect choice for those looking for value in a machine tool quality CNC Plasma Cutting System. The rigid, all-steel frame supports a variety of standard or high-definition plasma units and is combined with the industry's easiest to use operator interface, as well as the quality features and high level of service that comes with owning a MultiCam.

And because its a MultiCam, the 3000 Series also comes with the full support of the MultiCam Technology Center network, with locations worldwide. MultiCam sales, service, support, and training are always located nearby.



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Innovation. Quality. Performance.

3000 Series Specifications

No machine offers more standard features than the MultiCam.

- User-friendly operator interface
- High-Speed contouring
- Fully programmable retract between parts.
- Automatic initial pierce height
- User-friendly MultiCam EZ Control
- Material Database
- Precision dual X-axis drives
- Stress-relieved heavy duty all steel construction.
- 25 mm linear ball bearing profile rails for maximum stiffness
- 12 Megabytes of Memory with unlimited file size transfer capabilities
- Standard Ethernet or RS232 direct connections



Integrated Material Database

Normally when you change material type, material thickness, or arc current many parameters such as feedrate, pierce delay, pierce height, etc. all need to be adjusted. MultiCam has made this process simple by integrating all of these cutting values into an easy-to-use menu driven database on our hand held controller. The user simply selects material type, thickness, and arc current and all of the settings are adjusted automatically.



Zoned down draft table (Optional)

To get the best fume extraction, MultiCam focuses the fume extraction in the cutting area. Pneumatic control of plenum zones is integrated directly into the MultiCam controller. This advanced integration allows us to focus the fume evacuation where the cutting is by opening and closing ports or zones. Zone control is automatic and programmable. Additional parameters adjust zone crossing for smoother zone transitions.



Base Frame

The MultiCam 3000 Series base frame is a one piece steel plate frame that is welded, stress relieved, and machined. One piece construction allows for a very accurate and smooth cutting system. It also greatly reduces the amount of time needed for installation and basically removes the possibility for installation errors that could affect the performance and accuracy of the system.

Dual X axis – 25mm Linear Rails, AC Brushless Servos, Precision Planetary Gearboxes, and Rack and Pinion.



Gantry

The gantry is made of a 3/8" thick steel tube that is welded, stress-relieved, and precision machined. The gantry has been engineered to provide a smooth, vibration free cut.

Y axis – 25mm Linear Rails, AC Brushless Servos, Precision Planetary Gearboxes, and Rack and Pinion.



Gantry Supports

The 3000 Series gantry supports are manufactured from grey iron castings. These cast iron components in conjunction with wide X-axis bearing spacing, help dampen vibration and give the structural tube gantry extremely rigid support.

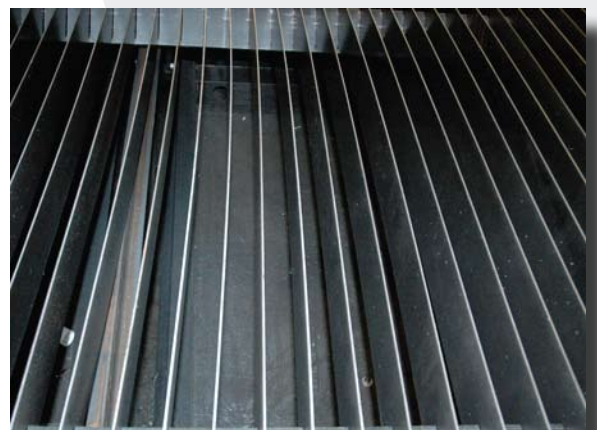
Table

MultiCam has engineered custom cut steel slats that help to greatly reduce dross build up.

Working surface: steel slat down draft
Loading capacity: up to 1.5" thick steel

Feed

Cutting Speed: 1,000 ipm
Rapid Traverse (X and Y): 1,800 ipm

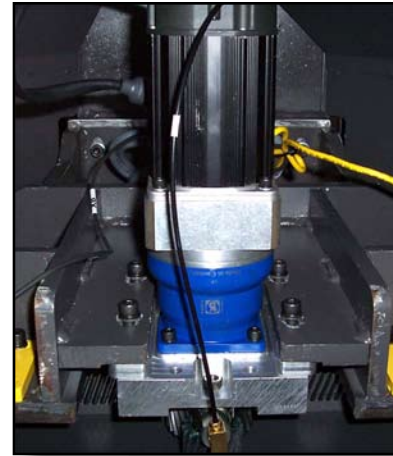


3000 Series Specifications

Precision Planetary Gearboxes

Alpha Precision Planetary Gearboxes are the top of the line in the industry. Case hardened and finished ground high carbon alloy steel gears guarantee the lowest backlash and highest service life available. Alpha Gearboxes are one of the many components that make the MultiCam a smooth, accurate, and long-lasting cutting system.

- Single Stage 10:1
- Backlash < 2 arcmin
- Efficiency > 97%
- Low noise level
- Designed for cyclic and continuous operation with a 100% duty cycle
- 5-Year Manufacturer Warranty



Regulator Units

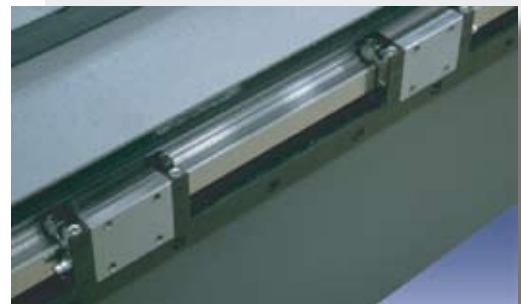
Machines equipped with tool changing spindles come standard with SMC filter regulator units that also include an ambient air drier.



Linear Bearings

25 mm ball linear bearing profile rails with stainless spring steel strip cover

- High rigidity and load capacities in all directions.
- Lowest possible noise level and best running characteristics.
- High torque load capacity
- 4 bearing packs per axis



Dross Trays (optional)

Removal dross trays make it possible to easily retrieve small parts that fall into the cutting table. They also simplify the process of cleaning the vacuum plenum. The dross trays are supported by 6 Industrial Radial load track cam rollers. Each roller has the capacity of supporting up to 1,800 lbs and enables the dross trays to roll smoothly in and out of the cutting table.



Digital Servo Drives

Teknic's SSt Eclipse E750 digital servo drives are high-bandwidth, digital vector servo drive systems and are standard on all 3000 Series machines. These drives seamlessly integrate position, velocity, and torque loops to provide uncompromised tracking accuracy, smoothness and reliability. The Eclipse drives used in MultiCam servo-driven machines are the latest in a line of high-performance drives that advances the state of the art by utilizing this seamless coordination in such a way to allow all information to be shared in real time so all system functions cooperate in any situation. For example, if the torque loop senses that the motor has reached 100% torque output, it is instantly passed upstream to the servo compensator and the system delivers a coordinated response, maintaining precise control. You will realize tighter tracking, smoother motion, and faster rapid traverse - all of which yield superior machine throughput and reliability.

Servo Drive Features

- SSt Eclipse E750 servo is 30A peak, 15 continuous @ 330Vdc
- Digital control loops with 800Hz large signal velocity bandwidth
- 2kHz small signal response
- 35 microsecond total servo phase delay. The SSt Eclipse drive is the fastest in the industry
- True, closed-loop, sinewave commutation with vector feed-forward and DQ decoupling provides near-zero torque response time at any speed. This maximizes motor responsiveness and minimizes motor heating
- The SSt Eclipse drive utilizes an adaptive control algorithm (IMT) based on Neural Fuzzy Logic
- The IMT virtually eliminates the concern of inertia matching and allows for loads of large and varying inertia without impacting performance.
- The SSt Eclipse drive uses small-signal, sliding-mode, automatic gain modulation to eliminate hunting even with extreme gains. Axes will be perfectly still and have no loss of tracking or position accuracy.



Servo Amps

- Teknic's proprietary Regressive Auto Spline™ (RAS) technology produces ultra-smooth trajectories. The profiles are jerk and jerk-derivative limited, which reduces shock, vibration, noise, and mechanical wear.
- Many safety and protection features including: Short circuit (phase-to-phase, phase-to-ground), over temperature, over voltage, over current, protected for open windings, fuse, True RMS torque limiting, automatic speed limit, motor jam detection, and much more
- Superior tracking accuracy multi-derivative, state feed-forward gains greatly improve tracking performance and do not create the audible noise and torque chatter of traditional implementations

Teknic has been designing and building digital servo drives for nearly two decades. Tens of thousands of drives are sent into the field each year to OEMs, with the first having been delivered in 1994. With that field experience and an evolutionary approach, the SSt-Eclipse Series used by MultiCam is standing on the shoulders of the drives before it, which yields not only robust performance, but also MTBF numbers that make the competition blush. The MTBF of the SSt Eclipse E750, for example, is over 700,000 hours.

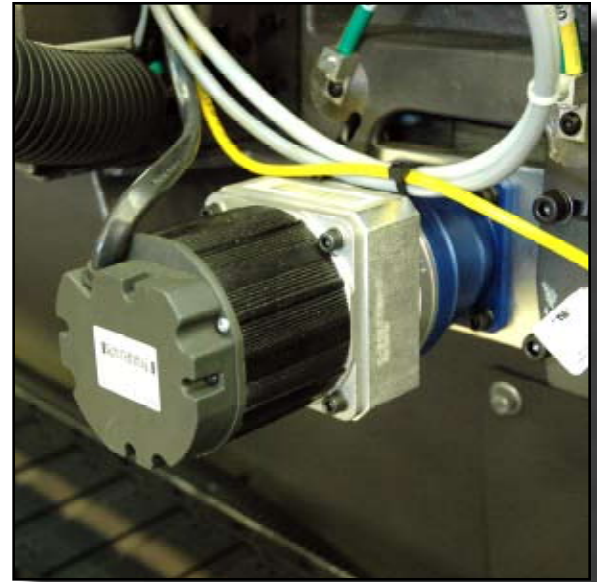
3000 Series Specifications

Brushless AC Servo Motors

After extensive testing, MultiCam has found the Teknic Hudson Brushless AC Servo Motors to be the premier solution on the market today. Teknic has an extensive history in motors and controls dating back to its founding in 1985. With a long history of providing critical components to military and aerospace applications and a leading supplier to commercial and industrial applications, Teknic creates servo motors that give MultiCam machines a competitive edge in the market.

Brushless AC Servo Motor Features

- 50 lb. indefinite radial load limit 1" from face
- Brushless, maintenance-free sinewave servo motors with oversized, high precision, deep groove radial bearings being the only wear point
- Neodymium-Iron-Boron magnets providing high power density and fade-free performance
- High power-to-rotor inertia ratio
- Direct winding on electrostatically powder-coated stators gives high thermal conductivity for better RMS ratings.
- Windings are rated to 155°C, improving thermal range.
- Extremely low electrical time constants increase motor responsiveness, which provides superior tracking accuracy to competitive units.
- Low distortion, sinusoidal back EMF combined with low detent torque improves motor smoothness and lowers audible noise.
- Precision bearings both reduce viscous friction and motor noise at high speed and help smooth motion. The high precision bearings are mechanically captivated and chemically bonded to maintain proper preload and alignment under all rated load conditions and accidental impacts. The drive shaft is made of stainless steel.
- The stators are glued and mechanically locked to prevent slippage regardless of use conditions.
- Finite element analysis is utilized to reduce stress concentration on machined areas of the shaft. This allows the use of oversized bearings without sacrificing shaft strength.



Servo Motor

- The stainless steel encoder disk is a floating differential, and the read head has a multiple-aperture grating for reliable operation even when dusty or dirty. It will not break like glass encoder disks. The read head is also fully encapsulated for increased reliability and ruggedness. Combined with the triple redundant reading/voting circuits in the drive, this provides incredibly robust encoder capability.
- The encoder housing is integral to the shaft automatically compensating for thermal expansion.
- The 4000-line encoder with quadrature sampling produces 16,000 counts per revolution.

Adaptive Automatic Torch Height Control

MultiCam has introduced one of the most advanced automatic torch height control systems on the market today. The challenge was to make the torch height control extremely responsive when cutting thin metals and very smooth when cutting thick metals. To achieve the best cut quality possible it is critical to keep the torch tip to work distance very consistent. If the torch height control is too responsive on thick metals the cut edge quality will not be smooth. If the torch height control is not responsive enough when cutting thin metals the torch will not be able to adjust quickly enough. The cut height will not be ideal and the torch may even crash into the material. Competitive torch height control systems are independent from the motion controller. They cannot automatically adapt to changes in cut speed and material thickness. The only connection to the motion controller is a signal that disables the torch height controller when the machine drops below 100% of the set cut speed. Because of this limited integration, the torch height controller is forced to use a set of parameters that is somewhere in the middle.

Unlike these controllers the MultiCam Torch Height Control is fully integrated with the motion controller. The sensitivity of the Torch Height control is automatically adjusted based on the current cutting parameters. The MultiCam gives the customer the best of both worlds. Very fast response when cutting thin metals, smooth slower adjustments when cutting thick plate. The best part is that all of these adjustments happen automatically for the end user. Height control is an integral function of the controller itself, there are fewer parts, which translates into less maintenance cost.



Quick-stop crash protection (optional)

The quick-stop crash protection torch holder makes changing consumable a snap, and protects your investment against serious damage.

During the cut process it is possible for small parts to tilt up. If the torch hits one of these obstacles, the torch release and shift to the side. The machine will pause and allow the user to fix the problem and continue on.



3000 Series Specifications

Standard Features



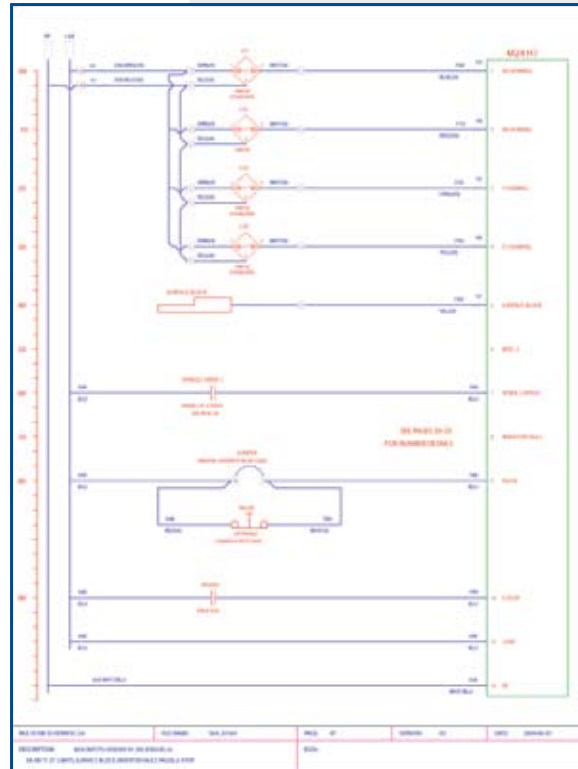
Leveling Feet



Tool Box



Operation Manual



Electrical Schematics

3000 Series Specs (inches)

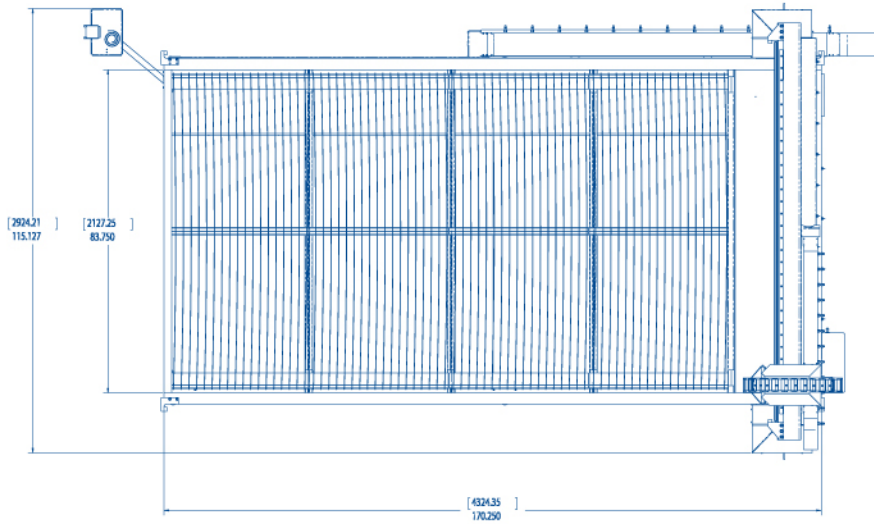
- Z-Axis Clearance: 4"
- Z-Axis Travel: 6"
- Repeatability: +/- .001"
- Positional Displacement Accuracy: +/- 0.005" over 10 feet
- Cutting Speed: 1,000 ipm*
- Rapid Traverse: 1,800 ipm*
- Drive System X and Y axis: Rack and Pinion
- Drive System Z axis: Lead Screw
- Standard Work Surface: Downdraft table

* Velocity specifications apply to servo systems only. Non-servo cutting speed - 600ipm, rapid traverse - 800ipm

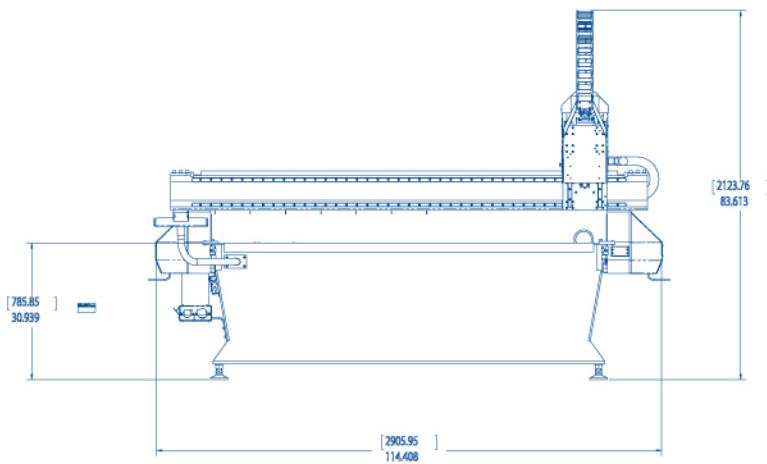
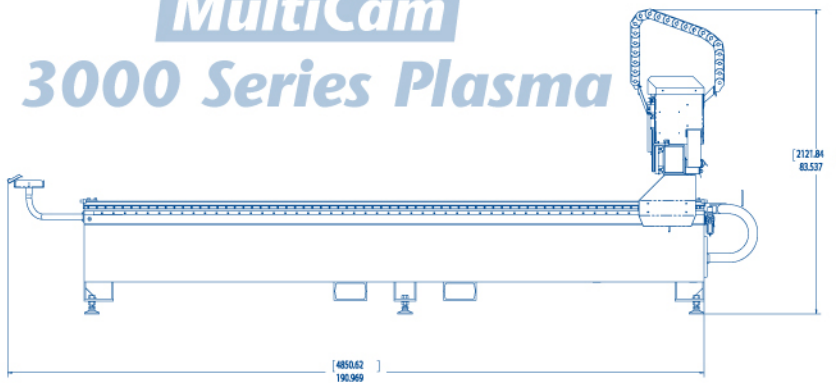
Size Chart (inches)

MODEL	L	L1	W	W1	H	WORKING AREA	WEIGHT LBS
101P HVAC	111	64	84	59	60	50 x 50	1900
103P	163	109	84	63	60	50 x 100	3850
204P HVAC	179	105	94	69	58	60 x 120	3050
204P	184	130	95	74	60	60 x 120	5150
205P	206	154	95	74	60	60 x 144	5450
208P HVAC	300	226	94	69	58	60 x 241	4450
208P	300	250	94	74	60	60 x 241	8100
305P*	206	154	114	93	60	80 x 144	6600
306P	233	178	114	93	60	80 x 169	7350
307P	255	202	114	93	60	80 x 193	8250
308P	300	250	114	93	60	80 x 241	9550
408P	300	250	130	109	60	96 x 241	11800

* Add 11 inches to W for optional dual Z axis. Add 36 inches to W for optional cantilever tube cutting gantry.



MultiCam[®] 3000 Series Plasma



3000 Series Specs (metric)

- Z-Axis Clearance: 101 mm
- Z-Axis Travel: 152 mm
- Repeatability: +/- .025 mm
- Positional Displacement Accuracy: +/- 0.125 mm over 3 meters
- Cutting Speed: 25.4 m/min (423 mm/sec) *
- Rapid Traverse: 43.2 m/min (720 mm/sec) *
- Drive System X and Y axis: Rack and Pinion
- Drive System Z axis: Lead Screw
- Standard Work Surface: Downdraft table

*15.2 m/min (254 mm/sec) cutting and rapid traverse for stepper systems

Size Chart (metric)

MODEL	L	L1	W	W1	H	WORKING AREA	WEIGHT Kg
101P HVAC	2819	1626	2134	1499	1524	1270 x 1270	860
103P	4140	2769	2134	1600	1524	1270 x 2540	1750
204P HVAC	4547	2667	2388	1753	1473	1524 x 3048	1380
204P	4674	3302	2413	1880	1524	1524 x 3048	2340
205P	5232	3912	2413	1880	1524	1524 x 3657	2470
208P HVAC	7620	5740	2388	1753	1473	1524 x 6121	2020
208P	7620	6350	2413	1880	1524	1524 x 6121	3670
305P*	5232	3912	2896	2362	1524	2032 x 3657	2990
306P	5918	4521	2896	2362	1524	2032 x 4292	3330
307P	6477	5131	2896	2362	1524	2032 x 4902	3740
308P	7620	6350	2896	2362	1524	2032 x 6121	4330
408P	7620	6350	3302	2769	1524	2438 x 6121	5350

* Add 280 mm to W for optional dual Z axis. Add 915 mm to W for optional cantilever tube cutting gantry.