

# Methods

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## MB-U Series

### 5-Axis Machining Centers



## BRIDGE TO SUCCESS

The MB-U series are bridge-type mills, allowing you to tackle any job, any workpiece, anytime. Bridge-style machines allow greater table access, more stability, and greater vibration dampening compared to other machine assemblies.

## STRENGTH IN NUMBERS

Rest easy knowing you're ready for any challenge with a 48-tool automatic tool changer (60 tools optional). The combination of ample tooling and a 1.9 second tool-to-tool change time allows you to switch up jobs on the fly or machine lights out for extended periods with redundant tooling.

MEET THE PRODUCT MANAGER

**DARREN WALL**



“Realizing there was a gap in the marketplace for a well-rounded, high-quality, five-axis machine, we tapped into our CNC expertise and dedication to customer satisfaction to design the MB-U series.

Our unique vision was to create a versatile machine that could find a home in any shop. We wanted to create workhorse that could tackle any job, from high-speed roughing to precision finishing.

No matter what industry you're in or what job you throw at it — an MB-U will get it done.”

**Methods Machining Center**  
Product Manager

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## Any industry. Any job. Anytime.

Methods Machine Tools designed the MB-U series with a singular, laser-focused goal: build the most versatile machine tool possible.

Whether you're a mold-making shop, a top-tier automotive supplier, a sporting goods manufacturer, or a job shop that needs to change workpieces on a dime, there's a place for an MB-U machine in your shop.

We back all of our machines with industry-leading service, support, installation, and application teams who are dedicated to keeping your spindles running.

## Key Features

- ▶ Simultaneous 5-axis FANUC 31iM-B5 control with 15" color display, 1-megabyte part program storage, 2-gigabyte data server, 100 megabits per second Ethernet, and 600 block look ahead
- ▶ BIG-PLUS 40-taper, 15,000 rotations per minute (rpm) spindle with oil-air lubrication, chiller, motor plate cooling, and thermal compensation
- ▶ FANUC Alpha Series direct-drive, hollow-shaft spindle motor with 25 horsepower (hp) on the MB 650U and 10 hp (20 hp optional) on the MB 450U
- ▶ Prepared for 1,000 psi/70 bar coolant through spindle (CTS) and coupling
- ▶ 48-tool (60 tools optional) arm-type ATC,
- ▶ Standard laser tool length measurement and part probe systems
- ▶ Automatic measurements, calculations, and corrections thanks to the Blum TC-60 spindle probe, equipped with table center point calibration
- ▶ Rapid travels of 36/36/36 meters/minute (MB 650U) and 48/48/48 meters/minute (MB 450U)
- ▶ Heidenhain scales on all five axes guarantee precise positional accuracy and compensate for thermal distortions
- ▶ Dust-tight electrical cabinet with heat exchanger
- ▶ Full circular hydraulic brake system for rigid B- and C-axis clamping
- ▶ Comprehensive chip management system comprising of four spindle coolant nozzles, four spindle coolant ring nozzles, a chip washdown system, and a coolant gun
- ▶ Chain/hinge-type chip conveyor with 1,050 millimeter drop off height for efficient, versatile chip removal
- ▶ Instantly clear chips with dual spindle air blast nozzles, air gun
- ▶ Full enclosure with bellows-type roof with a manual retractable top door maintains clean work environment
- ▶ Automatic grease lubrication system reduces downtime, maintenance and extends the life of the machine
- ▶ Independent manual pulse generator (MPG) handwheel gives you greater control and increases the ease of use
- ▶ Methods safety spec (CE mark modified)
- ▶ Machine operating manual & control manual (CD)

**21 hand-scraped surfaces** create the ideal machining environment. Hand-scraping is the foundation of precision, forming a perfectly flat surface within millionths of an inch and up to 10 contact points per square inch. Hand-scraping limits chatter, prolongs machine life, and facilitates oil pockets that reduce wear and tear.

**Prevent the collision course and protect your investment** with FANUC's 3D interference check function. The advanced anti-collision system detects potential crashes in real time, safeguarding your tool, workpiece, and table. There's minimal setup time, and the system is easily adaptable.

**Maintain high speeds without breaking a sweat** with the lightning-like rapids of 36 inches per minute (ipm) on the 650U and 48 ipm on the 450U. The MB-U's impressive weight means it can maintain rapids without distorting the workpiece, providing the perfect balance of stability and speed.

**Always have the right tool for the right job** with the 48-tool\* ATC. The large-capacity ATC ensures you're equipped for anything, from a demanding job requiring dozens of tools to time-consuming jobs requiring redundant tooling. The auto door provides a debris-free machining environment.

\*60-tool ATC optional

**Building a better machine** starts with the design. MB-U machines are bridge mills, giving you better table access, the ability to machine a diverse range of parts and achieve higher tolerances through vibration dampening. All axis have linear guideways, providing better rigidity and durability compared to other constructions.

### Instant Automation

Automation is the easiest way to increase throughput. We've made it even easier with the MB 650U Automatic Manufacturing Package (AMP), which combines the accuracy and speed of Methods' five-axis MB 650U machining center and the convenience of the Indumatik UL300 automatic pallet changer (APC).



# MB-U Tech Specs

Technical specifications and features are more than numbers on a page; they tell you what a machine tool can accomplish and how it will perform in your shop. We designed MB 450U and 650U to withstand the most demanding machining conditions and adapt to any manufacturing environment. The MB-U series is constructed to perform at the highest levels without fail, these machines will stand the test of time.



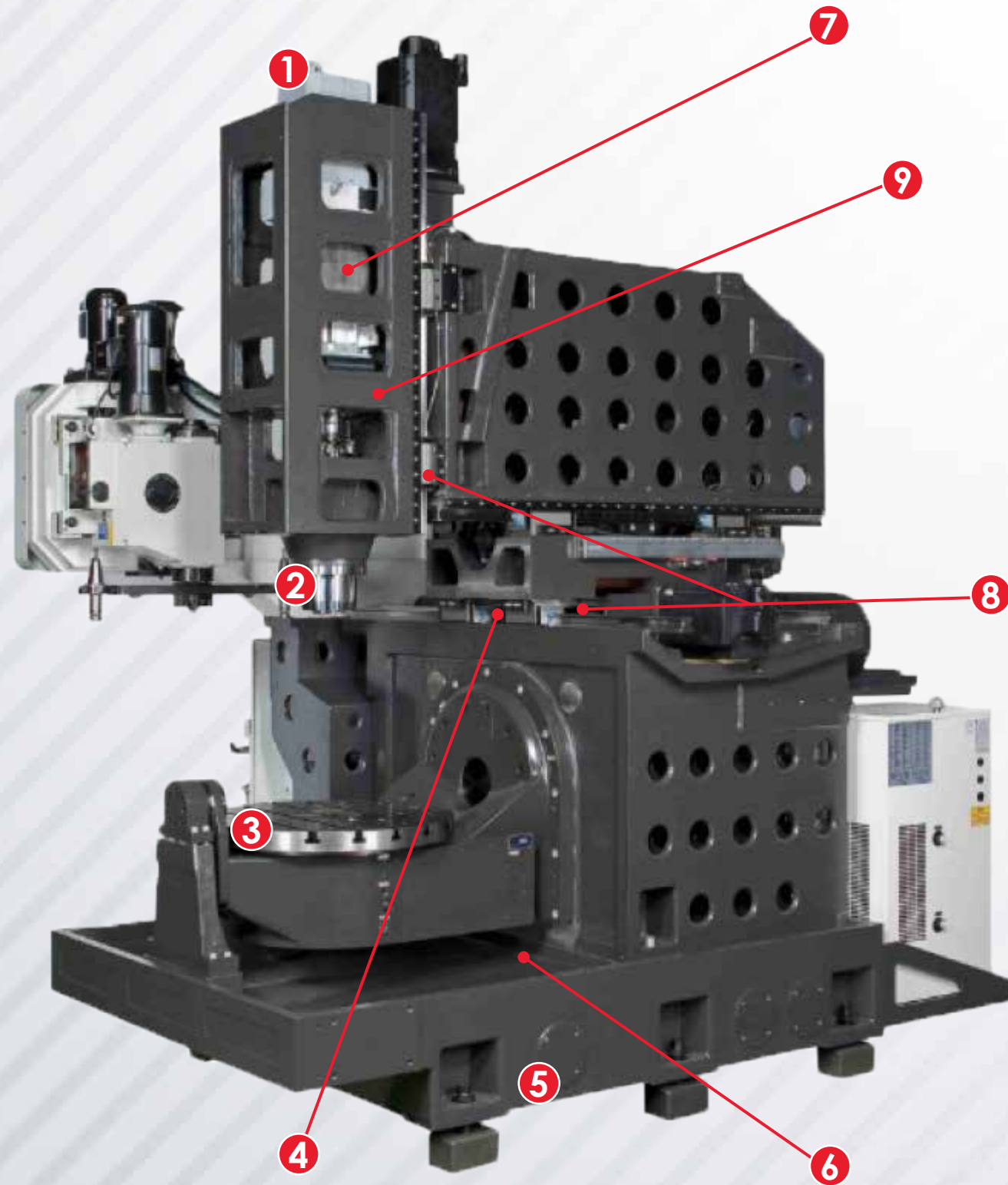
**MB 450U**

**MB 650U**

► **5-Axis Opportunities:** Machine intricate parts faster, reduce load/unload times, and eliminate opportunities for error with 5-axis machining. The MB 450U and 650U have the high-quality components and design attributes to give you a flawless 5-axis experience.

► **Clean Machine, Clear Results:** Our comprehensive chip management system, comprising of a coolant gun, coolant nozzles, and a chip conveyor, makes keeping your machining environment chip-free an effortless endeavor.

Feature	Unit	MB 450U	MB 650U
<b>TRAVEL</b>			
X/Y-Axis	in (mm)	X: 15.7 (400) Y: 13.8 (350)	X: 24.4 (620) Y: 20.47 (520)
Z-Axis	in (mm)	13.8 (350)	18.1 (460)
B-Axis Tilting	°	-5 ~ +110	
C-Axis Rotation	°	360	
<b>TABLE</b>			
Table Size (Diameter)	in (mm)	17.72 (450)	25.59 (650)
Max. Table Load	lbs (kg)	441 (200)	661 (300)
Number of T-Slots	qty	8	5
T-Slot Width	in (mm)	.55 (14)	.71 (18)
<b>SPINDLE</b>			
Spindle Speed	rpm	15,000	
Spindle Type	Dual Contact	BIG-PLUS 40-Taper	
Spindle Power	hp (kW) 30 min	10 (7.5)	25 (18.5)
Spindle Torque	ft-lb (nm) 30 min	35 (47.7)	93 (126)
Spindle Cooling	-	Chiller	
<b>AUTOMATIC TOOL CHANGER</b>			
Maximum Number of Tools	-	48 (60 optional)	
Maximum Tool Weight	lbs (kg)	15.4 (7)	
Maximum Tool Length	in (mm)	9.84 (250)	
<b>GENERAL</b>			
Floor Space	in (mm)	139 x 122.5 (3,538 x 3,112)	146.8 x 119.4 (3,729 x 3,032)
Weight	lbs (kg)	13,230 (6,000)	19,400 (8,800)
Height	in (mm)	119.8 (2,997)	130.3 (3,310)



MB 650U Casting

# A Solid Foundation 60+ Years in the Making

- 1 Power through the hardest materials** with the direct-drive, hollow-shaft spindle motor prepared for 1,000 psi CTS.
- 2 Powerful spindle, protective lubrication:** Handle roughing, precision cutting, surface finishing, and everything in between with the versatile BIG-PLUS, dual-contact 15,000 rpm spindle. The oil and air lubrication system helps prevent runout and keeps the spindle accurate and precise.
- 3 Increase efficiency and machine complex parts** with the B/C-type tilt rotary table. The 450U and 650U tables can handle loads up to 441 lbs and 661 lbs, respectively. B-axis tilting ranges from approximately  $-5^{\circ}$  to  $+110^{\circ}$ , and the C-axis can rotate  $360^{\circ}$ .
- 4 More uptime and productivity** thanks to the automatic grease lubrication system on all axes. Lubricating all axes inherently reduces downtime and maintenance.
- 5 Simulated conditions for natural machining.** Methods designed the MB-U series using finite element analysis (FEA) techniques – complex mathematical simulations – creating a natural machining experience. Castings meet Meehanite engineering standards, giving the machine uniform, dependable mechanical properties.
- 6 Maintain pristine part quality and preserve tool life** with the MB-U's comprehensive chip management system, comprised of a hinge-style conveyor, coolant wash down, and coolant flush gun.
- 7 Keep cool under pressure** even under the most extreme conditions, thanks to the spindle chiller and motor plate cooler. The spindle/head cooling system **keeps thermal growth in check.**
- 8 Robust roller guideways give you more rigidity and better vibration dampening.** Roller balls provide more rigidity compared to other guideways, and can handle varied loads without distorting the workpiece.
- 9 Adapt and adjust** with the thermal compensation system, utilizing five thermo-couples for real-time temperature feedback.

## Equipped with FANUC Fast Package III

FANUC's Most Advanced 5-Axis Software Package



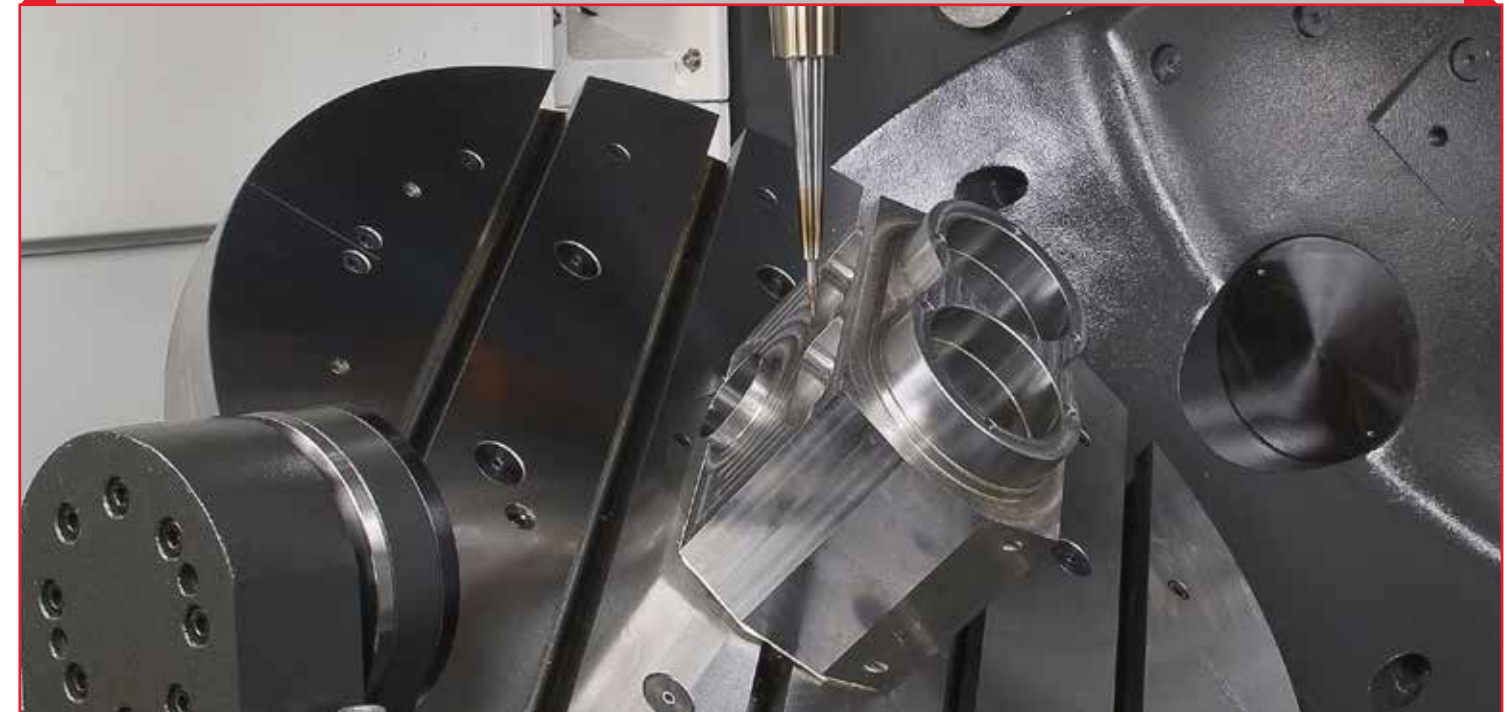
### Rest Assured with Time-Tested, Industry-Trusted Quality Control

- Methods Machine Tools sets rigid quality requirements that ensure our machines and inspection equipment are calibrated, monitored, and controlled using industry-standard systems and methods.
- Our team of seasoned machining experts, programmers, electrical engineers, and application specialists pour over every schematic and check every detail. We conduct rigorous tests and comb through every specification so you don't have to.

### Raising the Bar for Excellence

- All MB-U machines are laser-interferometer and ballbar-tested to certify perfect positioning while delivering practical data and benchmarks. These systems assess and confirm the static and dynamic accuracy of the machine.
- Ballbar testing monitors spindle movement across a programmed path and compares the results to a perfect circle. The test considers all the variables in machining, such as machine geometry, temperature fluctuations, and tool wear, to produce accurate parts and give you actionable data.
- Ballbar tests are recognized by international standards such as ISO 230-4 and ANSI/ASME B5.54.

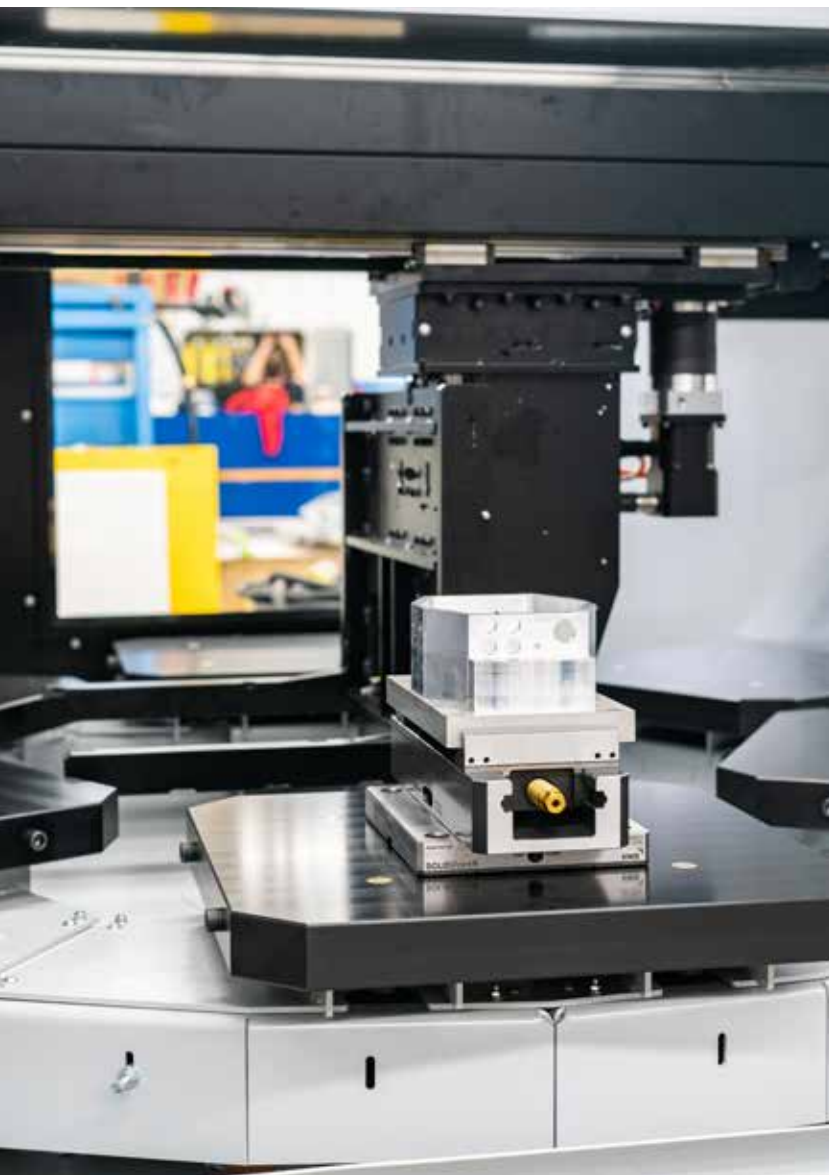
**A Dynamic High-Accuracy, High-Performance 5-Axis Simultaneous Cutting Test** is performed on each MB-U machine according to the NAS979 standard, ensuring that every machine meets and/or exceeds strict performance and quality specifications. Roundness Value Tested .0003" (8μ).



# MB 650U AMP

## Automatic Manufacturing Package (AMP)

Bring instant precision and automation into your shop, reduce manual intervention and improve throughput and uptime with the MB 650U AMP. The system combines the accuracy and speed of Methods' 5-axis MB 650U machining center and the convenience of the Indumatik UL300 automatic pallet changer (APC).



### APC POWER

The compact APC measures just 82.68" x 82.68" (2,100 mm x 2,100 mm). Combined with an expansive work envelope, the MB 650U AMP is a comprehensive, versatile manufacturing workhorse that can machine a variety of workpieces. **With six or eight pallet arrangements**, the MB 650U AMP can be configured to your specific needs.

### PRISTINE, PRECISE MACHINING

Features include meticulously crafted 21 hand-scraped surfaces, a dual-contact spindle, and tool probes, enabling precise, quick workpiece analysis. All five axes have Heidenhain scales, giving you the ability to obtain higher dimensional tolerances.



### MB 650U AMP FEATURES

- Six or eight pallet configurations
- Ergonomic load/unload station
- Simple, dedicated cell control
- Compact footprint

### MB 650U AMP SPECIFICATIONS

Spindle	25 hp, 106 ft-lbs of torque, 15,000 rpm
ATC Capacity	48 (60 optional)
Max Pallet Workpiece Size	6 pallets: 19.7" x 19.7" (500.38 mm x 500.38 mm) 8 pallets: 14.7" x 14.7" (400 mm x 400 mm)
Max Workpiece Weight	6 pallets: 425 lbs (193 kg) 8 pallets: 500 lbs (226.79 kg)

## SERVICE .....

Methods' earned its unique reputation by developing a comprehensive umbrella of support and sales services utilizing decades of hands-on experience and expertise. Our sales and support staff work with an extensive national network of distributors and dealers to offer specific solutions for machine shop owners.

The unique blend of seasoned engineers, young talent, and an average level of experience of 15 years guarantees customer satisfaction.



## APPLICATIONS .....

Methods applications engineering team is dedicated to solving challenges by integrating modifications and developing machining configurations. Our engineers analyze your needs and develop the best solution to elevate your business and help you reach your goals.

Methods has taken application engineering and technology to the next level, offering precise machine selection, programming, and automation. We stay ahead of the curve to keep you ahead of the competition.



## AUTOMATION .....

Automation offers the greatest potential for increased productivity. Methods has more than 30 automation specialists nationwide and includes design, control, integration/assembly, and field service/installation engineers. We recognize there is no one-size-fits-all solution. That's why all of our automation and integration specialists develop customer-specific solutions that reduce costs and increase throughput.



*\*Specifications are subject to change without notice*

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