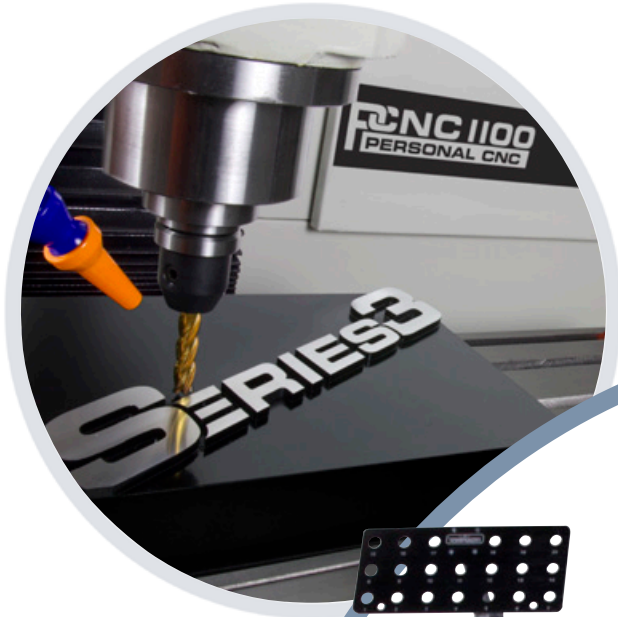


PCNC 1100

SERIES 3

PRODUCT DATASHEET



The Evolution of the *SERIES 3*

Series 3 is the next evolution of our best selling PCNC 1100 mill. For the 3rd generation, we've updated the motion system with ultra-quiet polyphase axis motors and the latest driver technology from Leadshine®.

The new drives and motors are not just quieter, but have performance improvements that are equally impressive, including better positional resolution, improved linearity & repeatability, and significant gains in available torque at cutting speeds. Include that with new co-polymer oil-resistant paint, a redesigned operator console and a host of other improvements and you can see how Series 3 provides Tormach's best combination of value and performance yet.

**OUR ENGINEERS ARE
EXCITED ABOUT THE
IMPROVEMENTS IN THE
NEW DRIVE SYSTEM.**



Tormach PCNC Mills

Tormach PCNC mills represent a new approach in small and bench top CNC milling machines, providing unprecedented value and versatility to machinists, engineers, inventors, makers, and hobbyists.

PCNC MILLS ARE EXCELLENT CHOICES FOR PROTOTYPING, EDUCATION, HOME SHOPS, SMALL-RUN PRODUCTION, CUSTOM MANUFACTURING AND LIGHT INDUSTRIAL JOBS.

Cut any material you want: steel, stainless, aluminum, plastic, titanium, iron – our mills have the horsepower, accuracy, and rigidity needed to get results.

Each PCNC can be customized with a suite of options and accessories to expand its utility. Our commitment to modular design principles means the latest accessories can be fit to any mill, regardless of purchase date so your mill can grow with your interests and expand with your business. We offer innovative and useful accessories to expand your PCNC Mill's capability, including a 4th Axis, Power Draw Bar, Automatic Tool Changer, and much more.

With rigid cast iron construction, precision scraped sliding surfaces, proven mechatronics, and robust electronics, PCNC mills are engineered



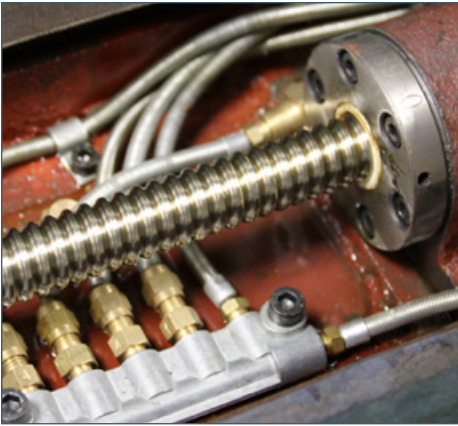
from the ground up to provide years of service and affordable ownership.

Each PCNC mill undergoes a comprehensive 30 point factory inspection prior to shipment, and our experienced technical support staff is available to assist with your questions and keep your mill making chips in the months and years after that.

ASK ANY TORMACH OWNER: OUR SUPPORT IS SECOND-TO-NONE, BOTH BEFORE AND AFTER DELIVERY.

Our customers purchase with confidence knowing they've chosen the best value in CNC. Once you've taken a look at us, we're sure that you'll agree, too.

Design



PRECISION GROUND BALLSCREWS

IRON

Cast Iron Construction

At over 1100 lbs of cast iron construction, the PCNC 1100 is built on a foundation engineered to do real work. Modern simulation techniques were used to create a reinforced design with superior rigidity in its class.

Ribbed Base Casting

The PCNC base casting is a sturdy platform for precision work. Ribbed reinforcements provide stiffness and resist deflection under load.

Pinned and Fitted Surfaces

All mating surfaces are hand scraped and pinned for precise trueness and alignment.

MOTION

Polyphase Steppers (New for Series 3)

Ultra-quiet polyphase stepper motors provide superior torque at cutting speeds. We've partnered with Leadshine® to incorporate the latest advances in microstepping driver technology. These drive systems not only provide superior torque at cutting speeds, but improved linearity, reduced vibration, and quieter operation when compared to other stepper systems available today.

Precision Ground Ballscrews

Each PCNC uses precision ground ballscrews. These screws are ground for precision. Other manufacturers may use cheaper, rolled screws which are not capable of providing the same level of precision. Our anti-backlash ballnuts use a superior double-nut technique to apply preload instead of a less expensive over-sized ball technique that results in premature wear.

Direct Drive Steppers

Our motors are coupled directly to the ballscrew. This not only improves positioning accuracy but reduces maintenance, since there is no belt or gearbox to wear or slip.

15 Point Lubrication

Each PCNC has a 15 point single shot lubrication system that distributes oil to each set of ways, gibs, and ballnuts with a single stroke.



AUTOMATIC OILER (OPTIONAL)

Design



EMERSON DRIVER



TORMACH SPINDLE

Polymer Bonded Slideways

The PCNC slideway surfaces are bonded with PTFE-filled Acetyl polymer. Similar in chemistry to brand name products like Turcite® and Rulon®, PTFE-filled Acetyl provides low friction and long life.

Tapered Gibs

PCNC mills use a tapered gib with dove-tail instead of inferior plate and screw design common on benchtop and other small mill machines. Tapered gibs can be easily adjusted to compensate for wear and eliminate non uniform bind points inherent to plate and screw gibs.

SPINDLE

Sensorless Vector Technology

We've partnered with Emerson Control Techniques™ to engineer a maintenance-free spindle drive with significant low speed torque, quick acceleration, and real cutting power throughout its speed range to get the job done.

Unlike a Volts/Hz drive, sensorless vector technology uses sophisticated drive intelligence to react quickly to changing spindle motor loads. This is essential to achieving consistent cutter performance in rapidly changing cutting conditions of a typical CNC program.

Industrial Grade Induction Motor

Induction Motors require zero maintenance and long life. Our 1.5 HP motor is robust and uses vacuum pressure impregnated resin for motor insulation to encase the entire stator and windings in resin for long life and trouble-free operation. VPI is the same technique used for demanding motor applications, including elevators and generators.

Exclusive Foldback Logic

The advanced programmability of the Spindle Drive has allowed us to offer our exclusive Foldback Logic as a standard feature with all PCNC 1100 mills. Foldback Logic senses when the motor cannot sustain commanded spindle speed under load and “folds back” to a sustainable speed with greater available motor torque.

Dual Pulley Belt Transmission

A dual pulley belt system is the best of both worlds. Two pulley ratios allow you to achieve necessary spindle RPMs without abandoning low speed torque necessary for large diameter drilling and tapping operations. Significant ratio overlap means changes are rarely necessary, but conveniently available when needed. Easily adjusted to compensated for wear and eliminate non-uniform bind points inherent to plate and screw gibs.

Details



MACH 3 CONTROL SOFTWARE

Control

Your PCNC ships with Mach3-enabled control software*. Mach3 is a versatile program for PC-based motion control.

Features include:

- Storage of up to 256 work offsets
- Storage of over 200 tool length offsets
- Graphical Tool path simulation
- G-code Editor
- MDI Manual Data Input line
- Selectable and programmable jog and step control
- Handy Programming Wizards to automate simple programming tasks using parametric tool and feature definitions.
- Active Modal list
- Feed/Speed Control Override
- Specialized control for Probing, Tool Setting, Tapping, and more.



TORMACH MACHINE CONTROLLER
*CONTROLLER SOLD SEPARATELY.

Details

Redesigned Operator Panel

The panel has been reorganized for improved workflow and the addition of an optional load meter display.

New and Improved Paint System

A new paint, based on a copolymer enamel system of cross-linked Acrylic Modified and Amino Resins. This new coating is resistant to most coolants and oils and engineered for adhesion and long life.

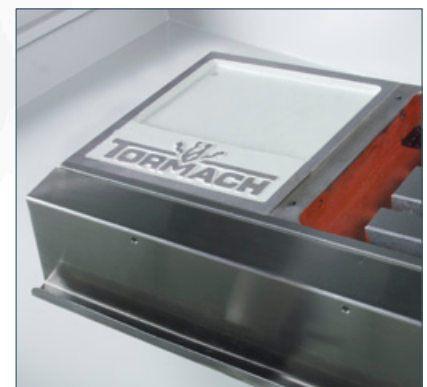


SERIES 3 OPERATOR PANEL



Cast Iron Tool Tray

A convenient cast iron tool tray has been added for handy storage.



CAST IRON TOOL TRAY

PCNC 1100 Options



AUTOMATIC TOOL CHANGER (ATC)

Automatic Tool Changer (ATC)

The Tormach Tooling System ATC is a 10 tool carousel-style automatic TTS tool changer for the PCNC 1100 Mill. The side mounted changer integrates with our existing power draw bar system to automatically change tools via controller command.

PN 32279: AUTOMATIC TOOL CHANGER (ATC)



DUALITY LATHE

Duality Lathe™

The Duality Lathe™ is a unique tool in the world of CNC with two operation modes. Away from your PCNC, it functions identical to a traditional manual mini-lathe; however, when mounted on to the bed of the PCNC 1100, it becomes a small CNC prototyping lathe at a fraction of the cost of a free-standing CNC lathe.

PN 30689: DUALITY LATHE™



4TH AXIS

4th Axis

Tormach PCNC mills come prewired and preconfigured for continuous 4th axis rotary motion. Our 4th axis options are available in several sizes and designed and built for machining operations that involve large forces, cutting fluids, and frequent operation. They use high performance direct drive motors and can be outfitted with a variety of chucks and accessories.

PN 30290: 4TH AXIS KIT 6 INCH

PN 30289: 4TH AXIS KIT 8 INCH



POWER DRAWBAR

Power Drawbar

The Power Drawbar integrates with your PCNC 1100 for lightning-fast manual tool changes with the push of a button and eliminates the need to hand-tighten your drawbar. To change tools, a pneumatic multi-stack air-over-air cylinder is actuated to depress the drawbar, releasing clamping pressure and opening the collet without putting harmful load on the spindle bearings. When the cylinder is released, the drawbar tightens and the tool is held firmly in place. This system provides over 2500lbs of holding force to the tool.

PN 31706: POWER DRAWBAR

Deluxe Stand with Integrated Coolant Kit

The Deluxe Machine Stand has been designed as a sturdy steel foundation for your PCNC 1100. Chips and coolant stay contained with its generous tray depth, back and side guarding. The table mounted guard shields in the forward direction, while the integrated coolant system keeps you running at maximum.

PN 30297: DELUXE STAND WITH INTEGRATED COOLANT KIT

PCNC 1100 Accessories



TORMACH TTS TOOLING SYSTEM

Tormach Tooling System™

Genuine TTS is the most popular and most expansive line of tooling for small milling machines - an affordable toolholding system that works with any R8 or MT3 spindle. Upgrade your existing toolholders with the advantages of TTS: offline tool measurement, repeatable Z offsets, increased rigidity and reduced stick out compared to traditional R8 toolholders.

CNC Scanner™

The Tormach CNC Scanner turns your PCNC into a high resolution 2D optical scanner and reverse engineering system. This unique tool has hundreds of uses, including toolmaking, artistry, repair and restoration, precision measurement, and quality assurance, to name a few.

PN 31738: CNC SCANNER™



CNC SCANNER™

Tormach Speeder™

The Speeder is a patented* RPM multiplier for Tormach PCNC mills and other mills with Bridgeport style quill. It multiplies native spindle speed by 3x using belt driven power transfer and a balanced spindle.

PN 31350: TORMACH SPEEDER™

MORE

Electronic Touch Probes and Tool Setter

Your PCNC mill includes an accessory port that allows you to interface electronic accessories to expand function or streamline part setup. We offer turn-key electronic touch probes and tool setters suitable for probing, digitizing, or setting tool and work offsets.

Workholding

A complete line of vises, vacuum chucks and clamps for common to custom workholding solutions.

CNC Workshops

Get the confidence you need to start making parts. Hands-on small group training options are available at our modern training center. All experience levels welcome.

SprutCAM for Tormach

SprutCAM is serious CAM with exceptional value. With other 40 programming strategies and support for 3D machining, lathe, and 4th axis, SprutCAM is a perfect match for programming your PCNC Mill.



TORMACH SPEEDER™

Specifications

Key Dimensions/Weight

Table Size:.....	34" x 9.5"
Table Slots:.....	3 Slots 5/8"
Travel:.....	18" x 9.5" x 16.25" (X,Y,Z)
Spindle Nose to Table:.....	17" maximum
Spindle Center to Column:.....	11"
Spindle Nose Diameter:.....	.3 3/8"
Shipping Dimensions:.....	56" x 45" x 60"
Weight:.....	1130 lbs net / 1296 lbs gross
Max Workpiece :.....	500 lbs Maximum

Power

Power Requirements:.....	200-250 VAC 50/60 Hz single phase (primary). 20A breaker recommended 115 VAC 50/60Hz (secondary)
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Spindle

Spindle Taper:.....	R8 (optional BT30 retrofit available)
Spindle Construction:.....	Cartridge with spindle lock
Spindle Drive:.....	Emerson Control Techniques™ Sensorless Vector Technology with Fold-back logic 1100W continuous, 2800W peak
Spindle Power:.....	1.5 hp Brushless AC 3-phase Induction Motor
Spindle Speed:.....	100 to 5100 RPM
Transmission:.....	V-Belt Drive, 2 ratios

Specifications

Iron

Frame and Table:.....Cast iron frame and table, with hand scraped hydrodynamic slide ways and tapered adjustment gibs

Way Surfaces:.....Low friction PTFE-filled Acetyl bonded sliding surface. Similar to Rulon[®] and Turcite[®]

Motion

Feed Rate:.....110 IPM (X,Y)
90 IPM (Z)

Axis Drives:.....High Performance Polyphase Stepper Motors with Leadshine[®] Microstepping Drivers

Ballscrews:.....Ground P4 ballscrew with double-nut anti-backlash ballnut
Incremental Error: <.0006"/ft
Cumulative Error: <.0008" at 35"

Control

Operator Console:.....Complete spindle control, plus
Spindle Lock-Out Key
Coolant On/Off/Auto

Controller:.....PC – MachOS (recommended) or Ubuntu Linux;
(Sold Separately) Windows XP, Vista, Windows 7 (compatible)
Mach3 license included with PCNC

Additional Control Features:.....Integrated DIN accessory port
Prewired for optional 4th -axis
Preconfigured for Electronic handwheel (Sold Separately)
Optional Remote E-Stop

ABOUT TORMACH

The people at Tormach are dedicated to delivering tools, accessories, and components of unprecedented value in the world of CNC and motion control. Whether you're involved in R&D, education, short run production, or simply an entrepreneur with an idea, you need to make things. Tormach products allow you to make what you need easier, quicker, and more affordably. We want to help make your goal a reality, to enable your ideas. Our mission is to empower people who make things. Whether you're cutting parts with our machine tools or building your own equipment using our components, our focus is to manifest your concepts and help you bring your ideas into reality.

ORDERING, PAYMENT & SHIPPING

Quotations can be requested online using our web based quotation system, or through FAX, email, or over the phone. Machines and accessories can also be ordered using our secure web shopping cart. Payment can be made by check, credit card, or wire transfer. Machines and machine stands are shipped via truck freight in North America, while accessories are normally shipped via package service (UPS, USPS, FedEx). Tormach ships worldwide in cooperation with established international freight forwarding companies.

WARRANTY AND SUPPORT

Machines and accessories are warranted for 12 months. Warranty service is limited to repair or replacement of components with telephone support, there is no on-site field service staff. Replacement parts are stocked at our Wisconsin facility. **Additional information is available at www.tormach.com.**



ENABLING YOUR IDEAS

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