

PCNC770

SERIES 3
PRODUCT DATASHEET

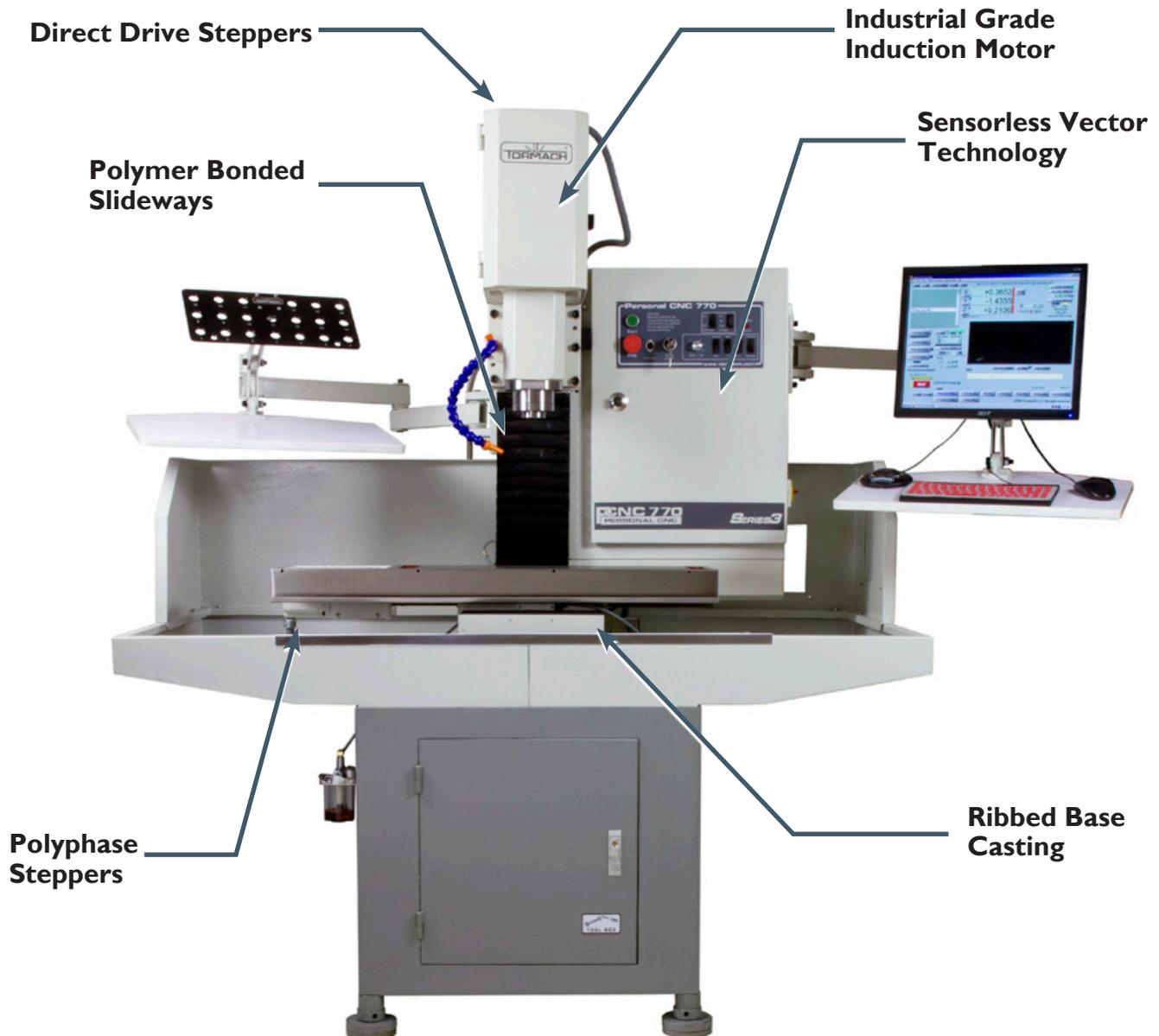


The Evolution of the *SERIES3*

Series 3 is the next evolution of our best selling PCNC 770 mill. In this generation, we've updated the motion system with ultra-quiet polyphase axis motors and the latest driver technology from Leadshine®.

The Leadshine and motors are not only quieter, impressive performance improvements include better positional resolution, improved linearity and repeatability, and significant gains in available torque at cutting speeds. New co-polymer oil-resistant paint, a redesigned operator console, and a host of other improvements clearly demonstrate why Series 3 is Tormach's best combination of value and performance to date.

**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.

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.

Cut any material you want with your mill: steel, stainless, aluminum, plastic, titanium, iron – Tormach 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 Drawbar,



Automatic Tool Changer and much more.

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



EMERSON DRIVER

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.

Unlike a Volts/Hz drive, sensorless vector technology uses sophisticated drive intelligence that reacts quickly to changing spindle motor loads. Improvements in reactor technology enables consistent cutter performance in rapidly changing cutting conditions in a typical CNC program.



TORMACH SPINDLE

Industrial Grade Induction Motor

Induction motors require zero maintenance and long life. Our 1.0 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.

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. The transmission can be easily adjusted to compensate for wear and eliminate non-uniform bind points inherent to plate and screw gibs.



PRECISION GROUND BALLSCREWS

MOTION

Polyphase Steppers

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, they improve linearity, reduce vibration, and have quieter operation when compared to other stepper systems available today.

Precision Ground Ballscrews

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

Design



POLYMER BONDED SLIDEWAYS

Direct Drive Steppers

Our motors are coupled directly to the ball screw. This improves positioning accuracy and reduces maintenance, as 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 ball nuts with a single stroke.

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.



AUTOMATIC OILER (OPTIONAL)

IRON

Cast Iron Construction

At over 660 lbs of rigid cast iron construction, the PCNC 770 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.

Breakdown Design

A unique feature of the PCNC 770 is the moving kit feature that allows transportation of the machine as subassemblies for increased portability. Tormach's patent-pending design allows for assembly and disassembly of the mill – move it in your shop or take it with you to a new location. This is only CNC mill designed specifically for machinists with basement shops.



A PATENT-PENDING MOVING KIT MAKES DISASSEMBLY OF THE PCNC 770 SAFER AND EASIER.

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.

Details



MACH 3 CONTROL SOFTWARE



TORMACH MACHINE CONTROLLER
*CONTROLLER SOLD SEPARATELY.

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.



SERIES 3 OPERATOR PANEL

Redesigned Operator Panel

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

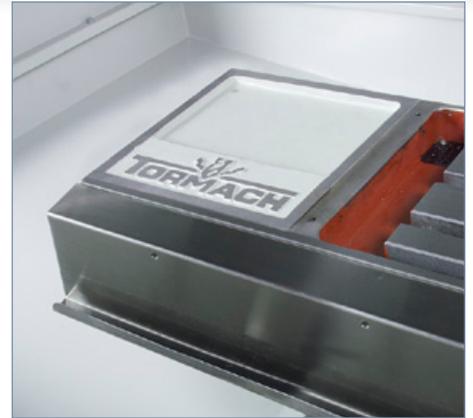
Details

New and Improved Paint System

Series 3 mills have been coated with a new paint that is 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.

Cast Iron Tool Tray

Each PCNC includes a cast iron tool tray for convenient and handy storage.



CAST IRON TOOL TRAY



PCNC 770 Options



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



POWER DRAWBAR

Power Drawbar

The Power Drawbar integrates with your PCNC 770 for lightning-fast manual tool changes with the push of a button, eliminating 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 2500 lbs of holding force to the tool.

PN 32436: PCNC 770 POWER DRAWBAR

Stand

The Stand has been designed as a sturdy steel foundation for your PCNC 770. 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 the mill running at maximum speeds.

PN 31191: PCNC 770 STAND



COOLANT KIT FOR PCNC 770

Coolant Kit

The flood Coolant Kit is highly recommended for general metal cutting. The kit includes a coolant reservoir tank, pump, hose, and necessary fittings, and mounting brackets. It also includes a backsplash surround and chip guard.

PN 31192: COOLANT KIT FOR PCNC 770



TORMACH TTS TOOLING SYSTEM
WWW.TORMACH.COM

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.

PCNC 770 Accessories



CNC SCANNER™

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™

Kress 800 Watt High Speed Spindle Kit

The Kress 800 FME is a premium quality German die grinder with and 800W motor with variable speed from 10000-29000 RPM. It includes 1/8" and 1/4" steel collets. Additional collet sizes are also available.

PN 31890: KRESS 800 WATT HIGH SPEED SPINDLE KIT



KRESS 800 WATT HIGH SPEED SPINDLE KIT
AND 5" CNC VISE FOR WORKHOLDING

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

Your PCNC mill also includes a complete line of vises, vacuum chucks, and clamps common to custom-workholding solutions.

CNC Workshops

Get the confidence you need to start making parts. Hands-on small group training workshops are available at our modern training center. All experience levels welcome and dates and class schedules are available on the Tormach website.

SprutCAM for Tormach

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

Specifications

Key Dimensions/Weight

Table Size:	28" x 8"
Table Slots:	3 Slots 5/8"
Travel:	14" x 7.5" x 13.25" (X,Y,Z)
Spindle Nose to Table:	14.8" maximum
Spindle Center to Column:	8 5/8"
Spindle Nose Diameter:	3 3/8"
Shipping Dimensions:	42" x 45" x 49"
Weight:	662 lbs net / 800 lbs gross
Max Workpiece :	400 lbs Maximum

Power

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

Spindle Taper:	R8
Spindle Construction:	Dynamically balanced cartridge with spindle lock
Spindle Drive:	Emerson Control Techniques™ Sensorless Vector Technology 750W continuous, 1300W peak
Spindle Power:	1.0 hp Brushless AC 3-phase Induction Motor, Vacuum Pressure Impregnated (VPI) Windings
Spindle Speed:	175 to 10000 RPM
Transmission:	Gates Polyflex® 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:	135 IPM (X,Y) 110 IPM (Z)
Axis Drives:	High Performance Polyphase Stepper Motors with Leadshine [®] Microstepping Drivers
Ballscrews:	P4 (medical grade) with double-nutted anti-backlash ball nut 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: (Sold Separately)	PC – MachOS (recommended) or Ubuntu Linux; 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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