Southwestern Industries, Inc.

K3 Knee Mill Specifications with the ProtoTRAK KMX Control

Machine Specifications

- Table Size – 10" x 50"
- T-Slots – 3" x 5/8"
- Table Travel – 32"
- Saddle Travel – 16"
- Knee Travel – 16"
- Maximum Quill Travel – 5"
- Quill Diameter – 86 mm
- Spindle Taper – R8
- Spindle Speed Range – 60-4200 RPM
- Head Tilt – +/- 90°
- Spindle Motor Power – 3 HP
- Power Requirement Control – 110V; 1P; 8A
- Power requirements, machine - 220/440V;3P; 8.5/4.25A
- Maximum Weight on Table – 850 lbs.
- Machine Weight – 2800 lbs.
- Machine dims l,w,h, - 78" x 103" x 69"
- Maximum rapid feed – 100 IPM
- Precision 7207 CP4 spindle bearings
- Chrome hardened and ground quill
- Meehanite castings
- Slide ways are Turcite coated
- Wide way surfaces are hardened and ground

Machine Options
- Glass Scales on table and saddle
- Auxiliary Function hardware box
- Electronic Handwheels
- Remote Stop/Go switch
- Power Drawbar
- Halogen Worklamp
- Chip Pan / Splash Shield
- Coolant Pump
- Spray Coolant
- Table Guard Enclosure
- Limit Switches
- Vise

KMX Control Specifications

Control Hardware

- Digital Servo Amplifiers – custom designed for ProtoTRAK operation
- D.C. Servo Motors – rated at 280 in-oz. continuous torque are twice that required
- Precision Ball Screws – in the table and saddle
- Modular Design – simplifies service and maximized uptime
- 115V/60HZ/10 amps
- Feedrate Override of programmed feedrate and rapid
- Polycarbonate Sealed Membrane Keypad to lock out contamination
- 9.0" Color LCD
- Windows® operating system
- USB port for interface with a storage device
- Rugged Industrial PC
- RJ45 Port and Ethernet card for Networking
- Glass Scale on quill for Z-axis readout

Software

- Clear, uncluttered screen display
- Prompted data inputs
- English language – no codes
- Soft keys – change within context
- Selectable two or three-axis CNC
- Inch/mm selectable
- Convenient modes of operation
- Diameter Cutter Compensation – allows programming of the part rather than the center of the tool path
- Circular interpolation – makes arcs and any size hole easy to do with standard tools
- Linear Interpolation – to machine lines at any angle
- Conrad – provides automatic corner radius programming with one data input
- Incremental and Absolute – programming can even be mixed within an event
- Error Messages – to identify programming mistakes
- Fault Messages – for system self-diagnostics
- Parts Graphics display
- Look – a single button press to view graphics during programming
- Math Help – for finding points in a prompted format with graphical representation of prompts
- Machine Tool Error Compensation and Backlash Compensation custom set on mill after installation
- Selectable Inch/mm measurement readout
- Jog of X and Y from 1 to 100 inches per minute
- Selectable 2 or 3-axis operation
- AGE Auto Geometry Engine

DRO Mode features
- Incremental and absolute dimensions
- Jog at rapid with override
- Powerfeed X, Y or Z (3-axis models)

- Teach-in of manual moves
- Servo return to 0 absolute
- Tool offsets from library
- Go To Dimensions (Optional with TRAKing®)
- Fine/Course handwheel resolution (Optional with TRAKing®)

Program Mode features
- Auto Geometry Engine
- Geometry-based programming
- Tool Path programming
- Scaling of print data
- Programming of Auxiliary Functions (when present in original control)
- Three-axis Geometry conversational programming (3-axis models)
- Incremental and absolute dimensions
- Automatic diameter cutter comp
- Circular interpolation
- Linear interpolation
- Look –graphics with a single button push
- Event editing within the program
- Conrad – automatic corner radius
- Math helps with graphical interface
- Tool step over adjustable for pocket routines
- Selectable ramp or plunge cutter entry
- Subroutine repeat of programmed events
- Nesting
- Subroutine Rotate about Z axis for skewing data
- Subroutine Mirror of programmed events
- Copy repeat for editing of repeated events
- Copy rotate for editing of rotated events
- Copy mirror for editing of mirrored events
- Run Island, Helix, Thread Mill and Engrave events when present in an imported ProtoTRAK program

Programmed Canned Cycles
- Posn/Drill – single point
- Bolt Hole – series of points evenly spaced around a circle
- Mill – straight line in any direction
- Arc – any portion of a circle
- Pocket – a rectangle, circle or irregular and all the material inside, includes finish cut
- Profile – a perimeter of a rectangle, circle or irregular shape, includes finish cut
- Repeat, Rotation, Mirror – of programmed events with or without offset

Set Up Mode Features
- Service Codes
  - Software
  - Machine Setup
  - Advanced Diagnostics and service logs
  - Operator Defaults and options

- Set Pocket and Face Mill step-over (in Service Codes)
- Tool library
- Tool names
- Tool length offset with modifiers
- Tool path graphics with adjustable views
- Verify – solid model representation of finished part (as programmed)

Run Mode Features
- TRAKing (Optional)
- 3D CAM file program run
- 3D G code file run with tool comp
- Real time run graphics with tool icon

Program In/Out Mode Features
- Program storage to USB flash drive
- CAM program converter
- Converter for prior-generation ProtoTRAK programs
- DXF/DWG file converter (Offline version only)
- Selection of file storage locations
- Preview graphics for unopened files
- Networking
- Save Temp to save current program, tool offsets and home positions for running the next day with minimal setup

Options
- Remote Stop/Go (RSG) switch
- USB thumb drive for program storage and transfer.
- Offline programming system
- DXF and Parasolid programming on Offline

Control Options

KMX Offline programming
- All features of the ProtoTRAK KMX organized to run on your PC
- Program and set up your jobs and then load into the ProtoTRAK KMX
- Windows operating system (will not work with Mac OS)
- **Converter Package for Offline** (requires purchase of KMX Offline Programming)
- Verify
- Solid model representation of machining the part including the tool path
- **The DXF File Converter**
  Import and convert CAD data into ProtoTRAK programs
  DXF or DWG files
  Chaining
  Automatic Gap Closing
  Layer control
  Easy, prompted process you can do right at the machine
- **The Parasolid File Converter**

Generate ProtoTRAK KMX programs from the data in the solid file
.x_t 3D CAD format
No specialized knowledge required

TRAKing/Electronic Handwheels Option (not available on all machines)
- Electronic Handwheels on X and Y (replaces the mechanical handwheels)
- TRAKing of programs during program run
- Go To Dimensions
- Selectable Fine/Coarse handwheel resolution