

QL-AXIS-PRO

Industrial Knee Milling Machine

Heavy-duty precision engineering for advanced manufacturing and training applications

The **QL-AXIS-PRO** is a heavy-duty, precision knee-type vertical milling machine engineered for advanced training, prototyping, and production applications. It combines servo-driven automatic feed, high-rigidity ISO-40 spindle, and a full 3-axis digital readout (DRO) system to ensure precision machining performance across a variety of materials, including steel, aluminum, and composites.

This industrial-grade machine delivers exceptional versatility and accuracy, making it the ideal choice for research laboratories, vocational institutions, and light industrial environments requiring robust, user-friendly milling capability. The QL-AXIS-PRO represents the perfect balance of power, precision, and operational efficiency.

With its comprehensive feature set and professional-grade construction, this machine handles everything from simple drilling operations to complex multi-axis machining tasks with consistent reliability and accuracy.



Precision Engineering

ISO-40 spindle with 3-axis DRO system



Servo-Driven

Automatic power feed for consistent results



Heavy-Duty

Built for demanding production environments

 **QUAKELOGIC**

Technical Specifications

The QL-AXIS-PRO is designed to meet the rigorous demands of modern manufacturing while maintaining ease of use for training applications. Its versatile configuration supports a wide range of machining operations, from basic milling tasks to complex multi-axis work.

1

Machine Type

Industrial Vertical Knee Milling Machine with Power Feed and DRO

2

Model Designation

QL-AXIS-PRO

3

Manufacturing Origin

QuakeLogic Engineering – Manufactured under ISO/CE compliance standards

4

Primary Applications

Training, prototyping, production of precision parts, flat/angled/spiral surfaces, gear cutting, slotting, and drilling operations

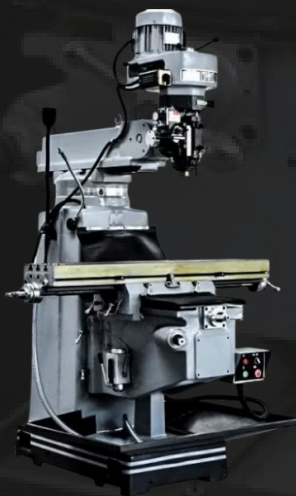


Table & Travel Specifications

The work table is the foundation of precision machining, and the QL-AXIS-PRO delivers exceptional capacity and accuracy. With a generous table size of 1370 × 305 mm (approximately 54 × 12 inches), this machine accommodates large workpieces while maintaining rigidity throughout the cutting process. The precision-ground hardened steel surface ensures flatness and durability for years of reliable service.

| Parameter | Value |
|----------------------|-------------------------------------|
| Table Size | 1370 × 305 mm (≈ 54 × 12 in.) |
| X-Axis Travel | 810 mm (≈ 32 in.) |
| Y-Axis Travel | 400 mm (≈ 16 in.) |
| Knee (Z-Axis) Travel | 400 mm (≈ 15 in.) |
| T-Slots | 3 slots – 16 mm width × 65 mm pitch |
| Max Workpiece Load | 700 kg |
| Table Surface | Precision-ground hardened steel |

The extensive travel ranges across all three axes provide exceptional flexibility for complex machining operations. The 810 mm X-axis travel allows for long workpieces, while the 400 mm Y and Z-axis travels ensure adequate clearance for tall components. Three precision T-slots with 16 mm width and 65 mm pitch spacing accommodate standard clamping fixtures and tooling, making setup efficient and secure.

With a maximum workpiece load capacity of 700 kg, the QL-AXIS-PRO handles substantial components without compromising accuracy or stability. The robust knee design maintains rigidity throughout the full range of vertical travel, ensuring consistent cutting performance regardless of table height.



Spindle & Head Assembly

Power & Precision

The heart of the QL-AXIS-PRO is its robust spindle and head assembly, featuring an ISO-40 taper for maximum tool compatibility and rigidity. The 3.7 kW (5 HP) variable-speed AC motor delivers consistent power across the entire speed range of 65 to 4000 rpm, controlled through a precision 3-step gearbox that ensures optimal torque at all speeds.

The 105 mm quill diameter provides exceptional stiffness, minimizing deflection during heavy cutting operations. With 127 mm of quill travel, the machine handles deep drilling and boring operations with ease.

4000

Maximum RPM

Variable speed range

5HP

Motor Power

Continuous duty rating

127mm

Quill Travel

Deep drilling capacity

| Parameter | Value |
|---------------------------|---|
| Spindle Taper | ISO-40 |
| Spindle Speed Range | 65 – 4000 rpm (variable, 3-step gearbox) |
| Spindle Travel (Quill) | 127 mm (≈ 5 in.) |
| Quill Diameter | 105 mm (≥ 4 in.) |
| Head Tilt (L–R) | ± 90° (total 180°) |
| Head Tilt (Front–Rear) | ± 45° |
| Distance Spindle to Table | 90 – 510 mm |
| Main Motor Power | 3.7 kW (5 HP) variable-speed AC motor |
| Drawbar | Factory-installed pneumatic powered drawbar |

The head assembly offers exceptional versatility with ± 90° left-right tilt (180° total) and ± 45° front-rear tilt, enabling complex angular machining operations. The factory-installed **pneumatic powered drawbar** system facilitates rapid tool changes, significantly reducing setup time and improving productivity in production environments.

Workbench, Z-Axis & Lubrication System

Robust Workbench



The QL-AXIS-PRO features a meticulously constructed workbench designed for maximum stability and precision. Crafted from high-grade, stress-relieved cast iron, its substantial mass effectively dampens vibrations, ensuring superior surface finish and accuracy during machining operations. The precision-ground working surface is equipped with standard T-slots for versatile and secure workpiece clamping, accommodating a wide range of fixturing setups.

Z-Axis Rectangular Guideway System



The vertical (Z-axis) movement is guided by a robust rectangular guideway system. These guideways are hardened and precision-ground, offering exceptional rigidity, superior load-bearing capacity, and prolonged accuracy. This design minimizes deflection and ensures smooth, precise vertical travel, crucial for deep drilling, boring, and complex 3D machining operations, even under heavy loads.

Integrated Manual Lubrication



To maintain peak performance and extend the lifespan of critical components, the machine incorporates a centralized manual lubrication system. This system allows for the direct and efficient application of lubricant to essential moving parts, including all guideways, ball screws, and other friction points. Regular manual lubrication ensures smooth operation, reduces wear, and prevents premature component failure, contributing to consistent machine accuracy and reliability.

| Component | Specification |
|-----------------------------|-------------------------------|
| Workbench Material | Stress-relieved Cast Iron |
| Guideway Type (Z-Axis) | Hardened & Ground Rectangular |
| Lubrication System | Centralized Manual Pump |
| Workbench Surface Treatment | Precision Ground |
| Workpiece Clamping | T-Slots |

Drive & Feed System

The QL-AXIS-PRO features an advanced servo-driven automatic power feed system that sets it apart from conventional manual milling machines. This sophisticated drive mechanism utilizes precision **ball-screw assemblies** on both X and Y axes, eliminating backlash and ensuring repeatable positioning accuracy. The servo motors provide smooth, consistent feed rates across the entire range of 1 to 120 inches per minute, allowing operators to optimize cutting parameters for different materials and operations.



Servo Control

Independent variable-speed drives for X and Y axes deliver precise feed control



Ball-Screw Precision

Zero-backlash transmission ensures accurate positioning and smooth motion



Variable Feed Range

1-120 in/min feed rates accommodate diverse machining requirements

| Parameter | Value |
|--------------------|---|
| Feed Type | Servo-driven automatic power feed |
| Feed Range (X/Y) | 1 – 120 in/min |
| Rapid Traverse (Z) | 10 – 40 in/min |
| Drive Mechanism | Precision ball-screw assemblies on X and Y axes |
| Motor Control | Independent variable-speed servo drives (X/Y) |

The Z-axis rapid traverse capability of 10 to 40 inches per minute significantly reduces non-cutting time, improving overall productivity. Independent motor control for each axis allows simultaneous multi-axis movements, enabling efficient contouring and complex toolpath execution. This advanced drive system transforms the QL-AXIS-PRO from a simple manual mill into a semi-automated precision machining center.

Control & Display System

The integrated 3-axis Digital Readout (DRO) system represents a quantum leap in operational efficiency and accuracy. This sophisticated control interface provides real-time positional feedback for all three axes (X, Y, and Z-knee) with an impressive resolution of 0.001 mm, enabling operators to achieve micron-level precision in their machining operations. The bright LED display remains clearly visible even in challenging lighting conditions, ensuring operators can monitor position data at a glance.



High-Resolution Display

Bright LED screen with 0.001 mm resolution provides crystal-clear positional feedback in any lighting condition, ensuring operators never lose track of critical measurements during complex machining operations.



Advanced Memory Functions

Store frequently used positions and dimensions in memory for rapid recall, dramatically reducing setup time for repeat jobs and minimizing the risk of measurement errors during production runs.



Dual Mode Operation

Switch seamlessly between incremental and absolute coordinate modes to match your preferred working method, with instant zero reset capability for establishing new reference points during multi-setup operations.

| Parameter | Value |
|-----------------------|--|
| Digital Readout (DRO) | 3-Axis (X, Y, Z-knee) system |
| Resolution | 0.001 mm |
| Display Type | Bright LED with real-time positional feedback |
| System Features | Zero reset, incremental/absolute modes, memory storage |

The DRO system's advanced features include zero reset functionality, allowing operators to establish new reference points instantly without manual calculation. Both incremental and absolute coordinate modes are supported, providing flexibility for different machining strategies. Memory storage capability enables operators to save frequently used positions and dimensions, streamlining setup for repeat jobs and reducing the potential for measurement errors. This intelligent control system transforms complex machining tasks into straightforward, repeatable operations.

Electrical System

The QL-AXIS-PRO is powered by a robust 600V AC, 3-phase, 60 Hz electrical system designed for industrial environments. All electrical components meet rigorous **CSA and CE certification standards**, ensuring compliance with North American and European safety regulations. This dual certification demonstrates the machine's suitability for international markets and its adherence to the highest safety standards.

Comprehensive protection systems safeguard both operators and equipment. An integrated overload protection circuit prevents motor damage from excessive loads, while the emergency interlock system provides immediate shutdown capability in critical situations. The e-stop circuit is strategically positioned for quick access, ensuring operator safety remains paramount during all operations.

An integrated LED work light illuminates the cutting area with bright, shadow-free lighting, improving visibility and reducing operator fatigue during extended machining sessions. The energy-efficient LED technology provides superior illumination while minimizing power consumption and heat generation.

Power Supply

600V AC, 3-phase, 60 Hz industrial power

Safety Certified

CSA / CE certified components throughout

Protection Systems

Overload and emergency interlock circuits

LED Lighting

Integrated work light for optimal visibility

| Parameter | Value |
|-----------------------|---|
| Power Supply | 600 V AC, 3-phase, 60 Hz |
| Electrical Compliance | CSA / CE certified components |
| Protection | Overload and emergency interlock system |
| Lighting | Integrated LED work light |

Lubrication, Cooling & Safety

The QL-AXIS-PRO incorporates comprehensive support systems that ensure reliable operation, extended component life, and operator safety. The automatic centralized lubrication system delivers precise amounts of lubricant to all critical moving components at programmed intervals, eliminating the need for manual lubrication and ensuring consistent protection against wear. This automated approach not only extends machine life but also reduces maintenance requirements and prevents the premature failure that can result from inadequate or inconsistent lubrication.

01

Lubrication

Centralized system delivers precise lubrication to all critical components at programmed intervals, ensuring optimal protection and extended component life without manual intervention.

02

Integrated Cooling

High-capacity coolant pump with return system maintains optimal cutting temperatures, improves surface finish, and extends tool life while preventing thermal distortion of workpieces.

03

Comprehensive Safety

Full guarding for all moving components combined with emergency stop circuits protects operators while maintaining easy access for setup and maintenance operations.

04

Complete Documentation

Operator, Maintenance, and Parts Manuals provided in both English and French ensure proper operation and facilitate troubleshooting across diverse user environments.

| Parameter | Value |
|-----------------|---|
| Lubrication | Automatic centralized lubrication system |
| Cooling | Integrated coolant pump with return system |
| Safety Features | Full guarding for moving components, e-stop circuit |
| Manuals | Operator, Maintenance, and Parts Manuals (English / French) |

The integrated coolant system features a high-capacity pump with a complete return circuit, maintaining optimal cutting temperatures during demanding operations. Proper coolant flow improves surface finish, extends tool life, and prevents thermal distortion of workpieces. Full guarding protects operators from moving components while maintaining accessibility for setup and maintenance. Comprehensive documentation in both English and French ensures proper operation and maintenance across diverse user environments.

Machine Dimensions & Weight

1600

Net Weight (kg)

Robust construction

2.35

Height (meters)

Overall machine height

The QL-AXIS-PRO's substantial dimensions reflect its industrial-grade construction and capability. With overall dimensions of 1650 × 1750 × 2350 mm (length × width × height), the machine requires adequate floor space and ceiling clearance for installation. The 1600 kg net weight provides the mass necessary for vibration damping during heavy cutting operations, contributing to superior surface finish and dimensional accuracy.

When planning installation, consider additional space requirements for operator access, material handling, and maintenance activities. The machine's weight necessitates a reinforced concrete floor capable of supporting concentrated loads, and proper rigging equipment is essential for safe installation and positioning.

| Parameter | Value |
|--------------------------------|-----------------------|
| Overall Dimensions (L × W × H) | 1650 × 1750 × 2350 mm |
| Net Weight | 1600 kg |

The machine's footprint of 1650 × 1750 mm provides a stable base that resists deflection and vibration during operation. The 2350 mm height accommodates the full range of Z-axis travel while maintaining structural rigidity. These dimensions represent an optimal balance between workspace capacity and floor space efficiency, making the QL-AXIS-PRO suitable for facilities with standard industrial ceiling heights and floor loading capacities.

Included Accessories

The QL-AXIS-PRO arrives as a complete, ready-to-operate machining system with an extensive array of accessories and support equipment. This comprehensive package eliminates the need for separate accessory purchases and ensures operators have everything required to begin productive work immediately upon installation. Each component has been carefully selected to complement the machine's capabilities and support efficient operation from day one.

3-Axis Digital Readout

Factory-installed and calibrated DRO system provides immediate precision measurement capability

Pneumatic Drawbar

Powered tool change system dramatically reduces setup time and operator fatigue

Coolant & Lubrication

Complete fluid management systems ensure optimal cutting conditions and machine longevity

LED Work Light

Bright, energy-efficient illumination provides shadow-free visibility of the cutting area, reducing operator eye strain during extended machining sessions.

Complete Tool Kit

Full toolbox and wrench set includes all tools necessary for routine adjustments, maintenance, and accessory installation without requiring additional purchases.

Clamping & Alignment

Professional-grade clamping kit and precision alignment bars enable secure workpiece fixturing and accurate setup for complex machining operations.

Spare Parts & Consumables

Starter supply of critical spare parts and consumables ensures uninterrupted operation during the initial break-in period and familiarization phase.

Comprehensive Documentation

Complete English and French documentation set includes operator manuals, maintenance guides, parts lists, and troubleshooting procedures for all machine systems.

Warranty & Support

QuakeLogic stands behind the QL-AXIS-PRO with comprehensive warranty coverage and ongoing technical support designed to protect your investment and ensure long-term productivity. Our warranty program reflects our confidence in the machine's quality and our commitment to customer success. This multi-tiered coverage addresses both mechanical reliability and electronic system performance, providing peace of mind throughout the critical early operational period.

1

Mechanical & Electrical Coverage

12 months comprehensive parts and labor warranty covers all mechanical components, drive systems, motors, and electrical assemblies. This extended coverage period demonstrates our confidence in the machine's robust construction and quality manufacturing.

2

Control & DRO Systems

12 months warranty specifically covers the digital readout system and electronic control components, ensuring reliable operation of these sophisticated measurement and control technologies during the critical initial operating period.

3

Technical Support Services

Access to both **remote and on-site support** from factory-trained technicians ensures rapid resolution of any operational questions or technical issues. Our support team provides guidance on setup, operation, troubleshooting, and optimization.

4

Preventive Maintenance

Comprehensive maintenance guidance and guaranteed spare parts availability help you implement an effective preventive maintenance program, maximizing machine uptime and extending operational life well beyond the warranty period.

| Coverage | Duration |
|--------------------------------------|--|
| Mechanical and Electrical Components | 12 months (parts & labor) |
| Control and DRO Systems | 12 months |
| Technical Support | Remote + on-site support available |
| Preventive Maintenance | Guidance and spare parts availability included |

Our commitment extends beyond warranty coverage to include ongoing technical support and parts availability. Factory-trained technicians are available for both remote troubleshooting and on-site service calls when needed. We maintain comprehensive spare parts inventory to ensure rapid fulfillment of maintenance and repair requirements, minimizing downtime and maintaining productivity throughout the machine's operational life.



Contact Us

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QuakeLogic Inc. is a trusted name in precision industrial machinery, combining American engineering excellence with rigorous quality standards. Our team of experienced engineers and technicians is dedicated to delivering innovative solutions that meet the evolving needs of modern manufacturing, education, and research environments. We pride ourselves on responsive customer service, comprehensive technical support, and a commitment to long-term customer success.

Contact our sales team today to discuss how the QL-AXIS-PRO can enhance your machining capabilities, or visit our website to explore our complete range of precision manufacturing equipment and engineering solutions. We look forward to partnering with you to achieve your production and training objectives.