KEISER®

ENGINEERING HUMAN PERFORMANCE™

A400 TECHNOLOGY

A400 SEATED CALF

ASSESS, TRAIN, AND REHAB THE CALF AND ACHILLES TENDON WITH ONE TOOL.

Press into a new standard

The A400 Seated Calf was engineered to develop explosive lower-leg power, originally designed for world record holders Willie Banks (triple jump) and Mike Powell (long jump). Featuring unilateral movement, it ensures balanced strength development by allowing each leg to work independently. The machine automatically pre-loads and adjusts for leg length, providing a customized fit for optimal performance.

Unlike conventional weight-stack machines, the A400's low-inertia, pneumatic resistance delivers smooth, controlled movement, reducing stress on joints and minimizing shock loading. Integrated with Keiser's advanced A400 technology, it tracks real-time performance metrics and syncs seamlessly with the Keiser Metrics App for data-driven training optimization. The A400 Seated Calf offers a safer, more effective way to build lower-leg strength and power.

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Calf and Achilles injuries are very common

The soleus muscle is the primary force producer during ground contact in sprinting. Musculoskeletal modeling shows the plantarflexors are responsible for 49–62% of the vertical ground reaction force during running and nearly all of the propulsive component.[1, 2] The Achilles tendon stores and returns elastic strain energy at each step — it is the spring that makes efficient running possible.[2]

Achilles tendon injuries are among the most common tendon injuries in sport. Calf injuries account for 16.3% and Achilles injuries for 12.2% of all injuries in athletic populations.[3] The consequences of an Achilles rupture are severe and often career-altering.

The Achilles tendon is three subtendons, not one

The Achilles tendon is not a single, homogeneous structure. It is a composite of three subtendons arising from the medial gastrocnemius, lateral gastrocnemius, and soleus — each with distinct cross-sectional area, stiffness, twist patterns, and neural control.
[4, 5] During dynamic tasks, these subtendons do not strain uniformly. The soleus-derived subtendon is the stiffest of the three and often experiences the greatest elongation during locomotion.[4] Each triceps surae muscle exhibits distinct motor unit discharge behaviors that map onto its own subtendon pathway.[5]

This matters because tendinopathy and injury don't affect the Achilles uniformly. Multiple lines of evidence converge on the lateral gastrocnemius subtendon as the region most commonly disrupted in tendinopathy, showing reduced intratendinous sliding, selective stiffness loss, and diminished neural drive.[4, 5] Understanding which muscle feeds which subtendon is the basis for intelligent calf training and assessment.

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Why seated and not just standing

A standing calf raise does train the soleus — but only if the soleus is functioning normally. The problem is that the soleus can be inhibited following ankle sprains, periods of disuse, or tendinopathy, and the gastrocnemius will compensate. In a standing position (knee extended), the gastrocnemius is mechanically advantaged to dominate the movement. If the soleus is inhibited, the gastrocnemius picks up the slack and the deficit goes undetected. The athlete completes the rep, the numbers look fine, and the soleus stays underloaded.

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The seated position (knee flexed to ~90°) changes this. Knee flexion mechanically disadvantages the gastrocnemius by shortening it across both joints, reducing its activation and torque output.[6, 7] The soleus must do the work.
This is not a subtle bias. Straight-leg calf raises produce substantially greater gastrocnemius hypertrophy than bent-knee variations, while soleus hypertrophy remains similar across knee angles.[8] The seated position guarantees you are targeting the soleus and its subtendon.

For a population with high ankle sprain history and repetitive high-speed plantarflexion demands, the Seated Calf is not a convenience. It is the only way to confirm the soleus is actually being trained — and to detect when it is not.

A400 Seated Calf
An assessment and monitoring tool

The A400 Seated Calf operates each limb independently, making it three tools in one:

1. **Assessment.** Run a load-velocity profile (LVP) on each leg. Five loads, light to heavy, maximal intent on every rep. Compare left vs. right velocity at each load point. Asymmetries above 10% at a given load may warrant attention; asymmetries above 15% across multiple loads may be considered a flag.

2. **Rehabilitation.** Controlled, progressive loading with real-time velocity data. The A400’s eccentric overload feature (button-press load change) allows targeted eccentric-concentric protocols at precisely measured intensities. Tendon adaptation requires sustained loading within a specific strain window — generally above ~70% MVIC — and progressed through rate, not just load.[9, 10] The Seated Calf provides the precision and data tracking to dose this correctly: isometric holds, heavy slow resistance, and progressive dynamic loading, all on one machine with velocity and ROM feedback on every rep.

“THREE TOOLS IN ONE.”

3. **Monitoring.** Track velocity at a standardized load (e.g., 100% KOPR) on each leg across the season. A developing velocity asymmetry between limbs is an early warning of soleus fatigue, Achilles irritability, or residual deficit from a prior ankle injury — all before the athlete reports symptoms. This longitudinal monitoring capability is the difference between catching a problem at week 3 and catching it after a grade 2 strain.

Isometric loading in neutral and dorsiflexion

The Seated Calf also allows isometric contractions at specific joint angles — a distinct and important capability. Yielding isometric calf loading in both neutral and dorsiflexed ankle positions is supported by clinicians like Seth O'Neill as part of Achilles tendon management, both in early-stage rehab and as a maintenance strategy during periods when high-level ballistic tasks (sprinting, jumping, cutting) are already placing significant demand on the tendon through sport.[11, 12]

The logic is straightforward. When the athlete is already accumulating high-rate, high-strain tendon loading during sport-specific movement, adding more dynamic or ballistic calf work in the weight room may push total tendon strain beyond the effective adaptation window. Isometric holds at controlled intensities (above ~70% MVIC, 3–5 second holds) provide a sustained strain stimulus without the rate-dependent peaks of dynamic loading.[9, 10] This allows you to maintain tendon health and soleus capacity during the competitive season without compounding the ballistic load the tendon is already absorbing.

The A400 Seated Calf tracks load, ROM, and hold duration — giving the practitioner objective data to dose isometric work precisely across the season.

Cross-machine monitoring

Add more machines to enhance your lower body assessment and training opportunities. The full 8-machine lower body suite creates an assessment battery across the kinetic chain:

Machine	Joint / Muscle Group	L/R Asymmetry	Assessment Role
Leg Press	Hip + knee (compound)	Yes	Overall lower-body force capacity
Leg Extension Pro	Knee extension (quad isolation)	Yes	Quadriceps-specific deficits
Leg Curl Pro	Knee flexion (hamstring isolation)	Yes	Hamstring-specific deficits
Squat Pro	Hip + knee (compound)	No	Squat-pattern competency
4-Way Hip	Hip adduction, abduction, flexion, extension	Yes	Groin, hip abductor, hip flexor, and gluteal status
Seated Calf	Ankle plantarflexion, knee flexed (soleus)	Yes	Soleus and Achilles load capacity
Functional Trainer	Multi-planar cable	No	Accessory and anti-rotation patterns

Cross-machine LVP testing surfaces force and velocity asymmetries across the kinetic chain that single-joint or singl-pattern testing can miss, giving practitioners earlier, more complete data to inform training and return-to-play decisions.

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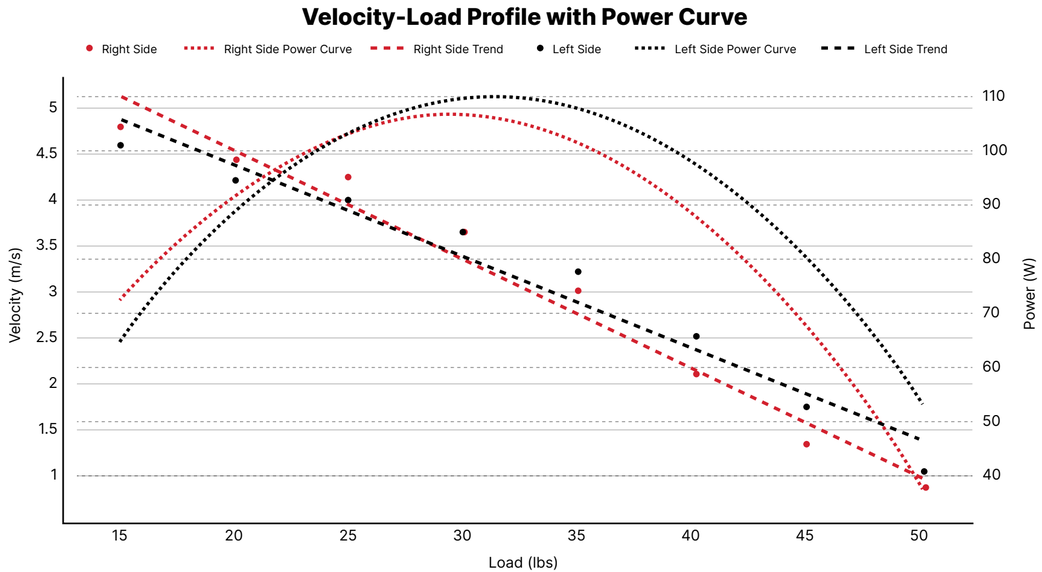
The A400 suite provides four streams of actionable data:

1. **Mean velocity** is the primary fatigue monitor. Track first-set velocity across training weeks. A consistent downward trend at a given load signals accumulated fatigue before the athlete reports it.

2. **Range of motion** is a movement quality indicator. A shrinking ROM on the Leg Press or Squat Pro under consistent load may indicate joint stiffness, pain avoidance, or developing pathology.

3. **Load-velocity profiles** provide individualized profiling across machines. Run LVPs every 4–6 weeks on the Leg Press, Leg Extension, Leg Curl, 4-Way Hip, and Seated Calf. Cross-machine triangulation reveals which link in the kinetic chain is limiting performance or developing asymmetry.

4. **Velocity outputs at fixed loads** enable weekly or biweekly monitoring. Track velocity at a standardized load (e.g., 100% KOPR) across the season. Velocity at this load is more sensitive to fatigue and adaptation than 1RM testing — and it does not require a maximal effort.



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A400 Seated Calf

- Unilateral movement allowing each limb to be trained symmetrically
- Increased resistance range for more intense functional workouts
- Smooth Keiser Dynamic Variable Resistance
- Fully adjustable to accommodate a wide range of users
- Bilateral movement capabilities for body symmetry training
- Large digital displays with resistance and counted repetitions

Specifications

- Height: 53” / 1346 mm
- Width: 29” / 737 mm
- Depth: 47” / 1194 mm
- Weight: 185 lbs / 84 kg
- Resistance: 0 - 814 lbs / 0 - 369 kg

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