



SI-H MKB Muscle Research System

Mechanical and optical measurements of intact and skinned muscle fibers



One instrument now virtually spans the entire muscle physiology field. Combining the versatility of the KG force transducers and a solid platform for mechanical studies and optical measurement, the Standard Muscle Research System can be equipped with photometers, a linear motor, a laser diode, perfusion cuvettes and temperature controls for running advanced muscle studies.

With the Standard Muscle Research System, at least five key experimental areas of muscle research can be examined.

- By measuring the myomechanical properties of contracting and relaxing muscle strips, scientists can measure intact muscle responses to electrical stimulation or tetanus in skeletal muscles

- Measure twitch amplitude and kinetics analysis, time to peak, 50% relaxation velocities, starting curve and diastolic force development
- Perform after loaded contractions in heart muscle
- Perform eccentric contractions in skeletal muscle
- Add a linear motor with control units to measure mechanical muscle properties like slack-test, isotonic release, constant velocity release, stretch release, vibration studies and after-loaded contractions
- Add a laser diode for simultaneous measurement of the sarcomere length of intact muscles and skinned muscle fibers
- Add a gradient maker for automated force-pCA and calcium studies in skinned muscle fibers

Features

- Data Recording and Analysis included
- Modular design for flexibility when upgrading
- Two cuvette tables (one with a single cuvette and the other with 10 Teflon troughs)
- Constructed with corrosion-free materials (Stainless steel, anodized aluminium, plastic)
- Lifetime warranty on optical force transducer



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Accessories

The flexibility of the Standard Muscle Research System allows for complete customization. For example, you can add a:

- Linear motor for muscle length perturbation studies
- Ergometer for afterload contraction in heart muscles and eccentric contractions
- Stimulator and tetanizer for intact muscle stimulation
- Photometer for intra-cellular calcium studies
- Cuvette system for intact muscle rapid cooling contractures
- Temperature jump system for skinned muscle fibers
- Software-controlled gradient maker for calcium studies
- Laser diode for sarcomere spacing studies in contracting muscles and skinned muscle fibers
- Laser-controlled perfusion system for highly accurate low-force measurements.
- Additional accessories like force transducers, bridge amplifiers, data acquisition system

Key Experiments

Measure intact muscle responses to electrical stimulation or tetanus

- Measure myomechanical properties of contractions and relaxation in muscle strips
- Perform after-loaded contractions in intact heart muscle and eccentric contractions in skeletal muscle
- Twitch amplitude and kinetics analysis, time to peak, (50%) relaxation velocities, starling curve, diastolic force development with Muscledata Software
- A linear motor plus control units can be adapted to measure mechanical muscle properties such as slack test, isotonic release, constant velocity release, stretch release, vibration and after-loaded contractions (intact muscle)
- A gradient maker can be fitted for automated force-pCa studies
- Near simultaneous measurement (alternating measurement in the same preparation) of the sarcomere length is possible by laser diode diffraction. This can be combined with an intracellular calcium measurement.
- Optional version of the system allows optical and sensor technologies to be used in metabolic research-enabled systems for oxygen consumption and muscle ATPase activity.