

THERMAL MANIKIN FOR  
CLOTHING AND ENVIRONMENTAL TESTING

# THERMAL MANIKIN NEWTON

Our Newton thermal manikin, designed in accordance with ASTM and ISO standards, meets garment evaluation needs used by testing institutes, apparel designers, and sleeping bag manufacturers, and currently in use by over 100 organizations across the globe.

Constructed using a thermally conductive carbon-epoxy shell with embedded heating and sensor wire elements, the 30-zone Newton is fully articulated at the shoulders, elbows, hips, knees, and ankles, enabling it to be posed for your target end use-case. The system also comes with a wide range of standard system options that satisfy most garment and environmental testing needs.

All Newton systems are complete, ready-to-use instruments including manikin, control electronics, laptop PC, and exclusive ThermDAC control software. Just add your own climate chamber for a comprehensive testing solution.

## Test Methods Supported

### Newton complies with

- ASTM F1291
- ASTM F1720
- ASTM F2370
- ASTM F2371
- ASTM F2732
- EN 13537
- EN 342 (requires walking stand)
- ISO 15831
- ISO 23537 (Part 1)





**Newton Specifications**

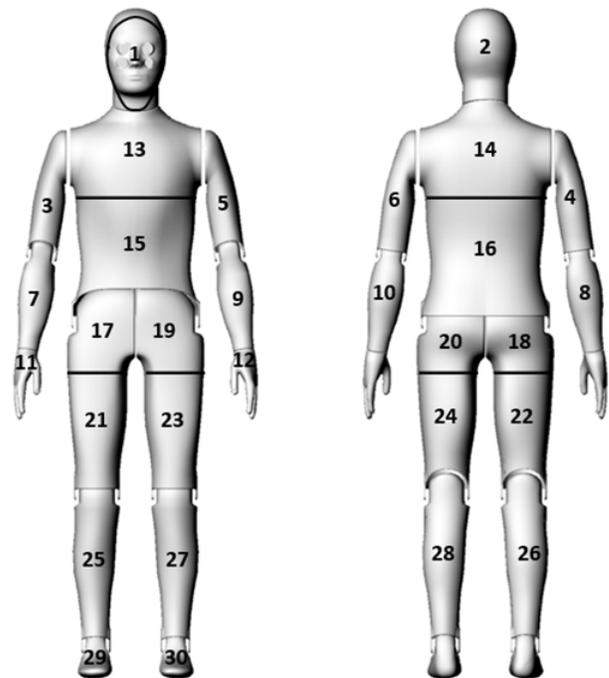
- Male body form height: 5 ft. 10 in./178.5 cm
  - Chest: 35.7 in./90.8 cm
  - Waist: 28.8 in./73.2 cm
  - Hip: 36.1 in./91.8 cm
- Small male body form height: 5 ft. 6 in./168.5 cm
  - Chest: 35.7 in./90.8 cm
  - Waist: 28.8 in./73.2 cm
  - Hip: 36.1 in./91.8 cm
- Manikin weight: ~ 50 lbs./23 kg
- Standard operating range: -20°C to +50°C
- Extended operating range: -40°C to +50°C (with “cold capable” option)
- 0 to 100% RH, including condensation
- Temperature accuracy: ± 0.1°C
- RH accuracy: ± 3%
- Maximum power output: 700 W/m<sup>2</sup>
- Sweating delivery range: 0-1,000 ml/hr/m<sup>2</sup>
- Power: 85-265VAC, 50/60Hz, Single-phase
- Power control cable length: 25 ft./7.5 m.

**Base Products Include:**

- Manikin body form with heaters and sensors
- Control electronics
- Two Ambient temperature sensors
- Laptop loaded with ThermDac control software
- Power and control cabling
- One relative humidity sensor
- One omni directional wind-speed sensor
- Manikin transport chair
- Standard one-year warranty

**Newton Feature Highlights & Benefits**

- Features 30 independent thermal zones
- Sweating version features computerized fluid delivery by zone
- Ultra-stable resistance wire heating provides uniform heat flux
- Temperature sensor elements are distributed over each zone and are protected by an epoxy coating
- Includes Ambient Temperature, RH, Windspeed sensors, and all cabling
- ThermDAC user interface software; optional ManikinPC physiological control



Standard thermal zone schematics



**ThermDAC Control Software**

ThermDAC is an engineered user interface for thermal manikin systems providing real-time device control, automated testing, and flexible display and logging capabilities, including:

- Manikin control by skin temperature, constant heat flux, comfort equation, ManikinPC
- User-programmable test configurations, stability criteria, linked work cycles
- Automatic steady-state detection
- Color-coded manikin pictorial displays, selectable for any manikin variable
- Zoomable time-history graph of multiple device and ambient variables
- Real-time statistical analysis over any user-selected time range
- Logging of raw data, statistical analysis, user-reports
- Device calibration and fault detection

**4D** **PHYSIOLOGY & COMFORT MODEL INTEGRATION**

Bring your manikin to life with the next dimension in testing; ManikinPC

- Real-time data
- Reduce dependence on human testing
- Shorten design cycles
- Design based on comfort metrics



501 - Thermal Manikin - Newton	Item #	Description	Product Name
Standard Base Products	19-50105	Newton Manikin, 30Z, Dry, Male 178.5 cm	501-XXX_d30.M
	19-50106	Newton Manikin, 30Z, Dry, Small Male 168.5 cm	501-XXX_d30.m
	19-50103	Newton Manikin, 30Z, Sweating, Male 178.5 cm	501-XXX_s30.M
	19-50104	Newton Manikin, 30Z, Sweating, Small Male 168.5	501-XXX_s30.m
Standard Options	20-00341	Walking Stand, 120VAC	—
	20-00340	Walking Stand, 240VAC	—
	20-00342	Walking Stand, Small Male, 120VAC	—
	20-00343	Walking Stand, Small Male, 240VAC	—
	20-00222	Hanging Stand	—
	20-00221	ASTM Cal Garment, Set, Newton Manikin	—
	20-00481	ASTM Cal Garment, Set, Small Newton Manikin	—
	11-01407	Software, ManikinPC License (Permanent) - US	—
11-03396	Software, ManikinPC License (Permanent) - OUS	—	
Custom Options	19-00001	Non-Humidified Breathing System	—
	19-00002	Humidified Breathing System	—
	XX-XXXXX	Cold Capable (Extended range to -40oC)	—

*Don't see what you need above? Contact Thermetrics to customize your perfect system. Keep your Newton in tip-top shape. Discuss service plan options and point-of-sale discounts with us at [sales@thermetrics.com](mailto:sales@thermetrics.com).*