



THERMETRICS FEMALE THERMAL MANIKIN

THERMAL MANIKIN LIZ

Thermetrics manikins have measured comfort in car cabins, estimated heat stress in protective wear, evaluated space suits for NASA, and supported testing for countless other scenarios. But until all of these scenarios utilized male manikins. Recognizing that garments and gear designed for females should be tested with female manikins, Thermetrics created Liz.

Liz complies with a broad range of ASTM and ISO standards. The manikin is constructed using a thermally conductive carbon-epoxy shell with embedded heating and sensor wire elements. Full articulation at the shoulders, elbows, hips, knees, and ankles permits a variety of body poses. 3D CAD modeling was used to ensure accurate morphology as well as manufacturing repeatability.

The standard 30-zone model has been optimized for garment and environmental testing needs, but the manikin can be customized for faster transient response, greater ambient range, or fitted for other research capabilities. All Thermetrics manikin systems are supplied as complete turnkey packages, including manikin form, control electronics, laptop PC, and exclusive ThermDAC control software. Just add your own climate chamber for a comprehensive testing solution.

Test Methods Supported

Liz 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)





Liz Specifications

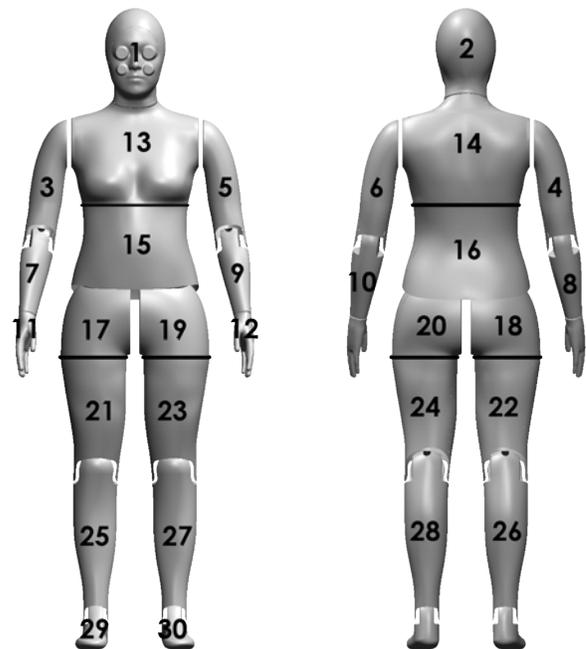
- Female body form height: 5 ft. 5 in./167 cm
 - Bust: 36.9 in./94 cm
 - Waist: 30 in./76 cm
 - Hip: 39.3 in./100 cm
- Manikin weight: ~ 60 lbs./27.5 kg
- Standard operating range: -20°C to +50°C
- Extended operating range: -40°C to +50°C (with “cold capable” option)
- 0 to 100% RH, including condensation
- Temperature accuracy: $\pm 0.1^\circ\text{C}$
- RH accuracy: $\pm 3\%$
- Maximum power output: 700 W/m²
- Sweating delivery range: 0-1,000 ml/hr/m²
- 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

Liz 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 30-zone format



ThermDAC Control Software

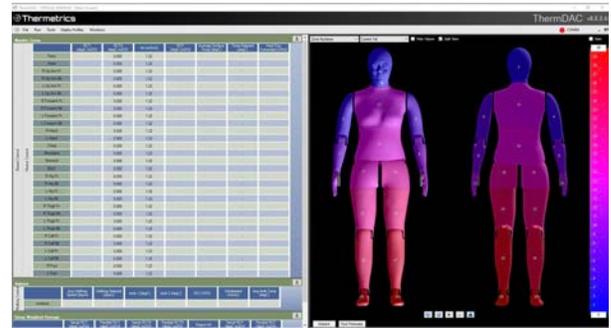
ThermDAC is an engineered user interface for thermal manikin systems providing real-time device control, automated testing, and flexible display and logging capabilities, including:

- 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



521 - Thermal Manikin - Liz	Item #	Description	Product Name
Standard Base Products	19-52101	Liz Manikin, 30Z, Dry, Female 167 cm	521-XXX_d30.F
	19-52100	Liz Manikin, 30Z, Sweating, Female 167 cm	521-XXX_s30.F
Standard Options	20-00341	Walking Stand, 120VAC	—
	20-00340	Walking Stand, 240VAC	—
	20-00222	Hanging Stand	—
	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-XXXX	Back Mount	—
	20-00846	Hanging Stand, Back Mount	—
	20-00848	Walking Stand, Back Mount, 120VAC	—
	XX-XXXX	Walking Stand, Back Mount, 240VAC	—
	XX-XXXX	Cold Capable	—

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