



TEL-TRU MANUFACTURING COMPANY BIMETAL THERMOMETERS



<i>Temperature + Pressure</i>	Since 1916
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NELSON JAMESON
INC.

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Tel-Tru Manufacturing Company

Temperature + Pressure Since
1916

We manufacture thermometers - but we sell service, reliability, product quality and performance.

► QUALITY AND PERFORMANCE FEATURES:

★ CASE AND BEZEL

- 304 stainless steel standard
- 316 stainless steel optional
- All external parts corrosion resistant to most chemicals
- Parts designed for maximum strength to meet requirements of heavy duty industrial applications
- Manufactured with precision tooling on modern OSHA approved stamping equipment
- Statistical Process Control QA methods used to assure component quality and process consistency
- Polished finish identifies Tel-Tru quality
- Cases may be silicone filled for additional dampening of extreme vibration, or to assure consistent performance in low process temperature/high environmental humidity applications

★ DATE STAMPING

- Available for QA tracking of industrial thermometers

★ HERMETIC SEAL

- Case/Bezel assembly is a precision interference fit
- Silicone gasket provides dustproof and leakproof seal
- Welded construction - Unique 360° TIG weld joins case, stem and threaded connection
- Testing conforms with ASME B40.3 procedures

★ THREADED CONNECTION

- 304 stainless steel standard
- 316 stainless steel optional
- Precision manufactured on Tel-Tru CNC machines
- Statistical Process Control QA methods used to assure component quality and process consistency

★ LENS

- Extra heavy duty instrument glass standard
- Shatterproof glass, tempered glass, and plastics optional

★ POINTER

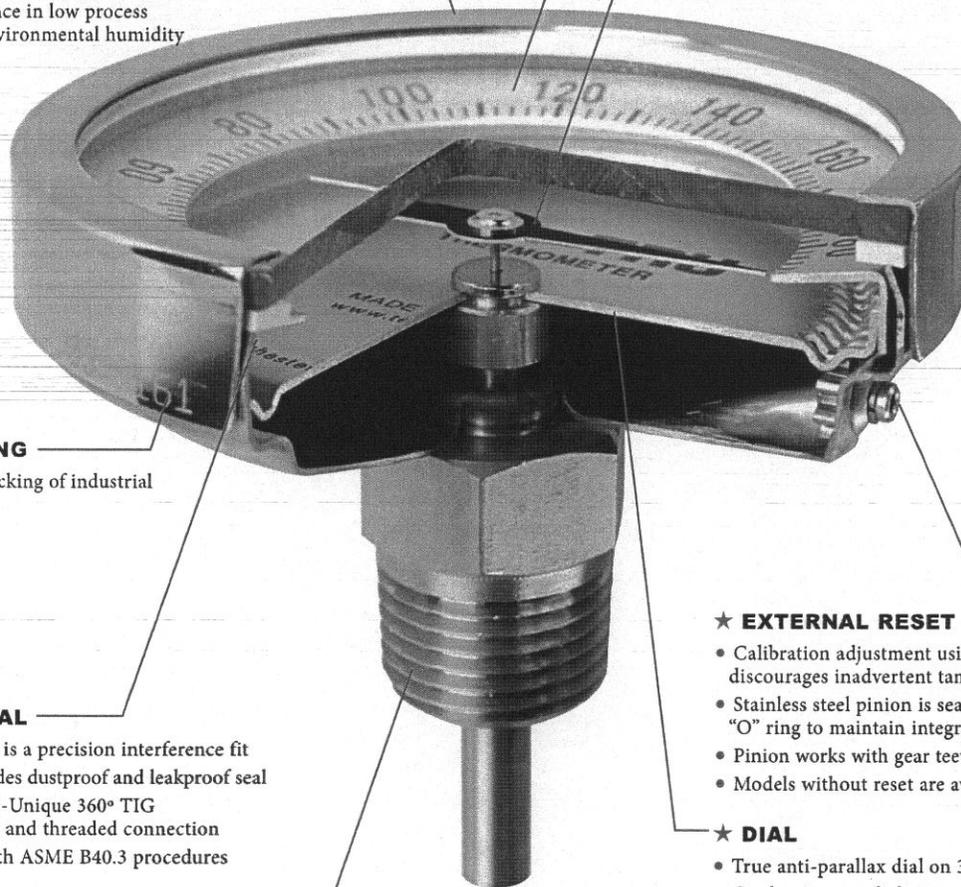
- Black painted aluminum
- Balanced and precisely assembled to bimetal coil stem
- Direct transfer of coil movement to temperature displayed on dial

★ EXTERNAL RESET

- Calibration adjustment using an Allen wrench discourages inadvertent tampering
- Stainless steel pinion is sealed with a silicone "O" ring to maintain integrity of hermetic seal
- Pinion works with gear teeth cut and formed in dial
- Models without reset are available

★ DIAL

- True anti-parallax dial on 3", 4" 5" models
- Graduations on dial ring are on the same plane as the pointer tip minimizing reading error
- Concave design of dial ring enhances readability
- White appearing .032" anodized aluminum
- Graduations for each temperature range are calculated to match deflection data of bimetallic material
- Large easy to read black numerals and graduations are printed on precision pad printing equipment in our factory



★ **BIMETAL COIL**

- Super sensitive bimetallic helix coil
- Fabricated to tight tolerances
- Heat treated for stress relief
- Silicone coated to minimize pointer vibration and maximize heat transfer and response time
- Angular deflection of each coil is tested for perfect match with dial graduation layouts in precision calibration baths designed and built by Tel-Tru with accuracy to $\pm\frac{1}{100}^{\circ}\text{F}$

★ **ACCURACY**

- Per ASME B40.3 Grade A $\pm 1\%$ full span is guaranteed
- Calibration is to standards traceable to National Institute of Standards and Testing (NIST)
- Tel-Tru methods:
 - * Most careful and precise in the industry
 - * Produces typical accuracy better than ASME B40.3 Grade AA (1%-%-1%) full span

★ **BIMETAL BUSHING**

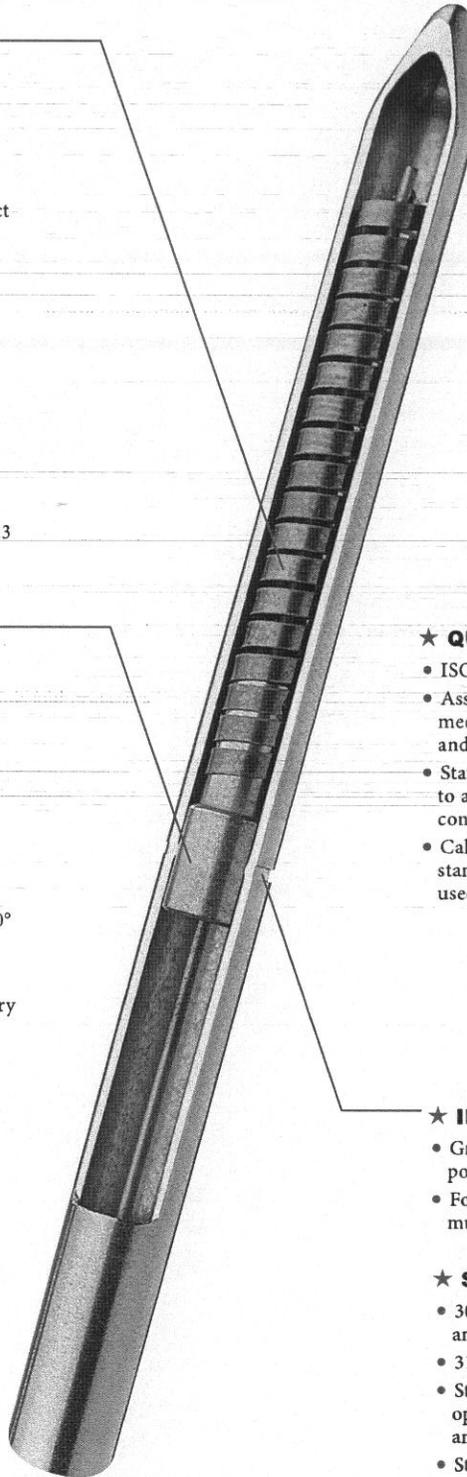
- Pressed into groove on stem
- Centers coil in stem
- 302 stainless steel stem wire goes through center of bushing connecting bimetal element to pointer, minimizes coil touching tube wall
- Centering bearings are used at regular intervals on long stem thermometers

★ **TEMPERATURE RANGES**

- 20 Standard Fahrenheit ranges from -100° to 1000°
- 20 Standard Celsius ranges from -75° to 550°
- 13 Standard Dual scale ranges
- Availability of over 120 ranges developed, may vary by dial size

★ **OVER TEMPERATURE LIMITS**

- Up to 250°F 100%
- 250°F to 550°F 50%
- 550°F to 1000°F 800°F for continuous use, intermittent use over 800°F



★ **QUALITY SYSTEM**

- ISO 9001:2008 certified
- Assures that all materials, methods and processes meet Tel-Tru's highest standards for form, fit, and function
- Statistical Process Control QA methods used to assure component quality and process consistency
- Calibration lab for NIST traceable verification of all standard thermometers and measuring instruments used in manufacturing process

★ **IMMERSION:**

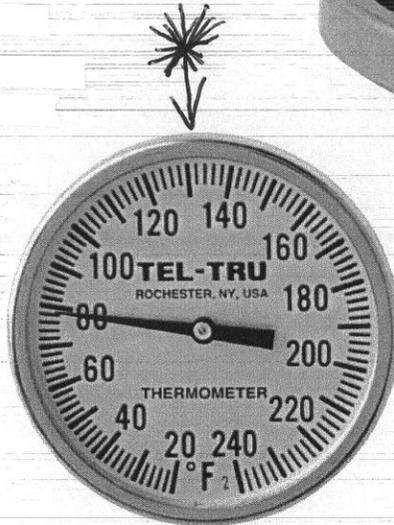
- Groove around stem shows minimum immersion point on each thermometer
- For most accurate reading sensitive portion of stem must be completely immersed

★ **STEM**

- 304 Stainless steel tubing is welded/drawn and fabricated to exacting tolerances
- 316 stainless steel optional
- Standard stem diameter is .250" (6.35mm) – options include .375" (9.52mm), .236" (6mm) and .315" (8mm)
- Stem lengths available from 2 1/2" to 120"
- Tip is welded and finished for hermetic seal and unique look

1³/₄" and 2" Back Connected Industrial Thermometers

A smaller size, heavy duty, rear connected unit commonly used in OEM equipment and light industrial applications.



LN-250R
(With 2" dial)



► MODEL CODES:

GT-200	1 ³ / ₄ " diameter head
GT-225	2" diameter head
LN-250	2" diameter head
LN-250R	2" diameter head with calibration feature

► SPECIFICATIONS:

Stem Lengths:	GT Models 2 ¹ / ₂ ", 4", 6", 8", 12", and 18". LN Models 2 ¹ / ₂ ", 4", 6", 9", 12", 15", 18" and 24" (available up to 120").
Stem Diameter:	GT model .150" standard up to 18" stem. LN model .250" standard up to 42" stem. LN model .375" is standard over 42" stem.
Connection:	GT models 1/8", 1/4", or 3/8" NPT is standard. LN models 1/4" NPT is standard.
External Reset:	LN-250R is easy to calibrate by loosening the socket head screw (above hex connecting nut) with 5/64" Allen wrench.
Construction:	304 stainless steel external parts. Welded construction. Corrosion resistant to most chemicals.
Hermetic seal:	Per ASME B40.3 dustproof and leakproof.
Dial:	Anodized aluminum with large black numbers and graduations.
Lens:	Glass.
Bimetal Coil:	Helix coil is silicone coated on ranges below 500°F for vibration dampening and to maximize heat transfer and response time.
Accuracy:	±1% full span per ASME B40.3 Grade A.
Over Temperature Limits:	Up to 250°F 100%; 250°F to 550°F, 50%; 550°F to 1000°F, continuous use up to 800°F, intermittent use over 800°F.



► **STANDARD RANGES:**

Fahrenheit	°/Div.	Celsius	°/Div.	Dual	
				Fahrenheit	Celsius
-100/100	2°	-75/175	5°	-100/100	-75/40
-50/120	2°	-50/100	1°	-40/160	-40/70
-40/160	2°	-50/25	1°	0/140	-18/60
0/140	2°	-50/50	1°	0/180	-18/82
0/180	2°	-40/70	1°	0/220	-10/100
0/200	2°	-20/120	1°	0/250	-20/120
0/220	2°	-10/110	1°	20/240	-10/110
0/250	2°	0/50	1/2°	25/125	0/50
20/240	2°	0/100	1°	50/300	10/150
25/125	1°	0/150	1°	50/400	0/200
50/250	2°	0/200	2°	50/500	0/250
50/300	2°	0/250	2°	150/750	50/400
50/400	5°	0/300	5°	* 200/1000	* 100/550
50/500	5°	0/400	5°		
50/550	5°	100/400	5°		
150/750	10°	* 100/550	5°		
* 200/1000	10°				

(Additional Ranges Available – Consult factory)

* Thermometers with temperature ranges 200/1000°F and 100/550°C are NOT RECOMMENDED FOR CONTINUOUS USE ABOVE 800°F/425°C (FOR INTERMITTENT USE ONLY).

► **OPTIONS:**

- Other threaded or plain connections.
- Silicone filled.
- Other lenses are acrylic, polycarbonate or tempered glass.
- Other stem diameters GT-200/GT-225 .140" (3.6mm) models. LN-250 .236" (6mm) and .375" (9.5mm).
- Other configuration combinations available upon request.

Estimated Shipping Weights		
MODEL	DRY	SILICONE FILLED
GT-200	3 oz.	N/A
GT-225	3 oz.	.5 oz.
LN-250 and LN-250R	5 oz.	.9 oz.

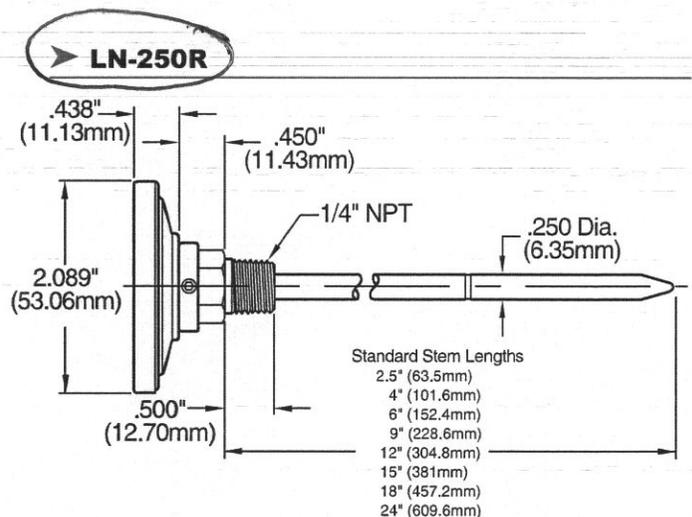
► **IMPORTANT NOTES:**

- 1) Thermowells are recommended for pressure, corrosive fluid or high velocity applications.
- 2) ASME B40.3— Bimetal thermometers manufactured by Tel-Tru and offered in this brochure are designed to meet or exceed this Standard issued by the American Society of Mechanical Engineers.

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BIMETAL INDUSTRIAL THERMOMETERS
 Operating and Calibrating Instructions

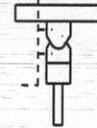
BACK CONNECT



BOTTOM CONNECT



ADJUSTABLE ANGLE



CALIBRATING INSTRUCTIONS:

- A master thermometer with a high degree of accuracy should be used for calibrating.
- Place thermometer to be calibrated alongside a master thermometer. Immerse both thermometers into an agitated liquid for at least 3 minutes. Compare temperatures. **IMPORTANT--**For accurate reading thermometer must be immersed PAST GROOVE on lower portion of stem. Master thermometer should also be immersed to same depth.

NOTE: "Recal" models can be calibrated by using the external reset feature as shown in Figures A, B, and C below.

GENERAL INFORMATION:

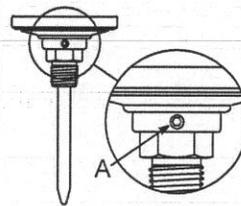
- Accuracy is $\pm 1\%$ full span per ASME B40.3 Grade A. Adjustment of the angle between case and stem may affect accuracy up to 0.5% of span (ASME B40.3).
- Over temperature limits - up to 250°F 100%; 250°F to 550°F, 50%; 550°F to 1000°F, continuous use up to 800°F, intermittent use over 800°F.
- For accurate reading thermometer must be immersed PAST GROOVE on lower portion of stem.

CAUTION:

- Any severe shock to the thermometer dropping, bending of the stem or head, etc., can possibly impair its accuracy.
- When installing thermometer into threaded connection, always tighten with wrench on hex nut. **NEVER** use the head of the thermometer for tightening--**SEVERE DAMAGE** to thermometer will result.

CALIBRATING 2" BACK CONNECTED MODEL

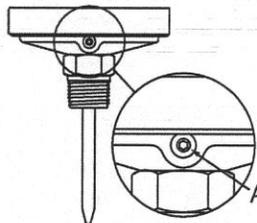
Figure A



- 1) Using a 5/64" hex key, loosen socket head screw (A) just above hex nut, 1/2 to 1 turn
- 2) Place wrench on hex connecting nut beneath head. Hold head and turn until pointer is at exact temperature
- 3) Tighten socket head screw
- 4) Remove hex key

CALIBRATING 3, 4, AND 5" BACK CONNECTED AND ADJUSTABLE ANGLE MODELS

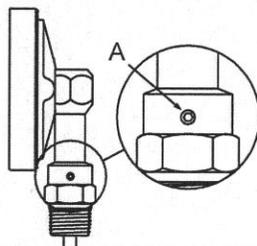
Figure B



- 1) Using a 1/16" hex key, insert into RESET opening (A) and turn until pointer is at exact temperature
- 2) Remove hex key

CALIBRATING 3, 4, AND 5" BOTTOM CONNECTED MODELS

Figure C



- 1) Using a 3/32" hex key, loosen 2 socket head screws (A) just above hex nut, 1/2 to 1 turn
- 2) Place wrench on hex connecting nut beneath head. Hold head and turn until pointer is at exact temperature
- 3) Tighten socket head screw
- 4) Remove hex key

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