

PRODUCT OVERVIEW

The intrinsically safe TL1-A thermometer is intended to be used anywhere a precision glass stem thermometer or other type thermometer may be used. The TL1-A is our latest stem thermometer. It is an improved version of the original ThermoProbe model TL-1. The TL1-A incorporates glass thermometer simplicity and reliability with the ease of a digital display. Like precision mercury thermometers, the TL1-A has accuracy, repeatability and long-term stability. But unlike those thermometers there will never be problems with mercury separation or hazardous material cleanup. Different from most electronic thermometers, the "Cordless" TL1-A has no wires to get in the way or break. Battery replacement is easily done through a sealed cover. Encoded calibration is unaffected by temperature, vibration or battery removal. Low battery display, and failure mode indications protect the user from false data. 4 Point NIST Traceable Calibration and a one year warranty included.



NEW FEATURES exclusive to the TL1-A include; auto-off after 20 minutes to save battery life, minimum reading, maximum reading, averaging, easier °F to °C switching and an optional serial output. In addition, the new display constantly indicates temperature increasing or decreasing activity.

Specifications

User Functions:	Auto Off after 20 minutes or continuous operation Lowest Reading, Highest Reading, Average Reading Switchable in Units of °F or °C
Construction:	Stainless Steel temperature sensor Standard Sensor length 8" (20cm) Standard diameter 1/4" (6.35mm) with reduced diameter tip of 3/16" (4.76mm) Sensor mount acetyl plastic Electronics and display in 3.5" x 1.2" anodized Aluminum enclosure Molded Silicone seal Highly durable display window, graphics and membrane switches
Weight:	3 ounces, 93 grams
Temperature:	Resolution 0.01 Degrees Calibrated Accuracy: ±0.1°F from 14 to 320°F ±0.06°C from -10 to 160°C NIST Traceable Report of Test
Temperature Time Constant:	14 Seconds in water bath.
Electronics:	Microcontroller and precision 20 bit A/D Converter FLASH memory Recommended Temperature Range For best Accuracy 32 to 112°F, 0 to 44°C 100 Ohm, Class A Platinum RTD Immersion depth 4", 11cm
Battery:	20mm Coin Size Duracell CR2032 Lithium 400 hour service life at 70°F, 21°C Battery Operating Range -4 to 130°F, -20 to 54°C Note: Battery may not provide adequate power below 40°F, 4°C

Specifications subject to change

Certifications



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Product Overview & Recommended Operation

The **TL1-R** thermometer is a compact reference thermometer with accuracy comparable to instrument systems costing twice as much. It has all the features of our standard TL1-A plus a higher level of accuracy. It can be used in applications where extreme accuracy is required. The TL1-R is also perfect for metrology applications and as a calibration reference thermometer.

It is an extremely accurate portable hand held instrument that is ideally suited for field applications and indoor laboratory uses.

The **TL1-R** uses a precision, 200 Ohm wire wound platinum resistance temperature sensor and attains its high accuracy through our proprietary calibration algorithm.

Standard 5 Point Calibration Report, Nominal Points -0.4, 32, 120, 200, 300 °F.

Higher range sensor and additional points above 300 °F are optional. Also available in °C.



Specifications

Display:	LCD with 0.25 inch characters Trend Indicating Arrows Low Battery & Fault indication
User Functions:	Auto Off after 20 minutes or continuous operation Lowest Reading, Highest Reading, Average Reading Switchable in Units of °F or °C Display hundredths or thousandths resolution
Construction:	Stainless Steel temperature sensor Standard Sensor length 8" (20cm) Sensor diameter 1/4" (6.35mm) Sensor mount acetyl plastic Electronics and display in 3.5" x 1.2" anodized Aluminum enclosure Molded Silicone seal Highly durable display window, graphics and membrane switches
Weight:	4 ounces, 124 grams
Standard Range:	0 to 300°F, -18 to 150°C
Standard Calibration:	0 to 300°F, -18 to 150°C Tolerance: +/- 0.07 °F, +/- 0.04 °C (@ 27°C ambient temp.) Resolution: 0.001 NIST Traceable Calibration
Operating Range:	32 to 112 °F, 0 to 49°C Recommended Calibration Frequency: 1 yr.
Temperature Response:	0 to 50 °C +/- 0.1°C in 3 Minutes, water bath
Electronics:	Microcontroller and precision 20 bit A/D Converter FLASH memory Minimum battery temp 4°C Maximum battery temp. 75 °C 200 Ohm, Wire Wound Platinum RTD
Battery:	20mm Coin Size 3V Lithium, Type 2032 400 hour service life at room temperatures.

Specifications subject to change.



Product Overview

The intrinsically safe **TL1-W** is a modified field version of our successful TL1-A thermometer. It features a rugged frame for reinforcement and is designed for continuous operation but can be easily powered off if desired.

The **TL1-W** thermometer is intended to be used anywhere a precision glass stem thermometer or other type thermometer may be used. The TL1-W

incorporates glass thermometer simplicity and reliability with the ease of a digital display. Like precision mercury thermometers, the TL1-W has accuracy, repeatability and long-term stability. But unlike those thermometers there will never be problems with mercury separation or hazardous material cleanup. Different from most precision electronic thermometers, the “Cordless” TL1-W has no wires to get in the way or break. Battery replacement is easily done through a sealed cover. Encoded calibration is unaffected by temperature, vibration or battery removal. Low battery display, and failure mode indications protect the user from false data. 4 Point NIST Traceable Calibration and a one year warranty included.

NEW FEATURES exclusive to the TL-1 and TL1-W include: minimum reading, maximum reading, averaging, and easier F to °C switching. In addition, the new display constantly indicates temperature increasing or decreasing activity.



Specifications

Display:	LCD with 0.25 inch characters Trend Indicating Arrows Low Battery & Fault indication
User Functions:	Auto-off after 20 minutes Lowest Reading, Highest Reading, Average Reading Switchable in Units of F or °C
Construction:	Stainless steel temperature sensor; Standard Sensor length 8" (20cm) Standard diameter 1/4" (6.35mm) with reduced diameter tip of 3/16" (4.76mm) Sturdy Acetal frame surrounding aluminum enclosure Electronics and display in 3.5" x 1.2" anodized Aluminum enclosure Molded Silicone seal Highly durable display window, graphics and membrane switches
Weight:	6.5 ounces, 180 grams
Temperature:	Range 14 to 320°F, -10 to 160°C Resolution 0.01 Degrees Calibrated Accuracy ±0.1°F , ±0.06°C
Temperature Time Constant:	14 Seconds in water bath.
Electronics:	Microcontroller and precision 20 bit A/D Converter FLASH memory Minimum ambient temp dependant on battery condition maximum ambient temp. 75 °C 100 Ohm, Class A Platinum RTD
Battery:	Two AAA size batteries for extended service
Options:	Stem length to 39", 1 m. Custom lengths available. Separate probe with high temp PFE cable Certification by independent calibration laboratory

Certifications



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EEx ib IIB T4



The TP-2 of the early 1980s became a long time favorite of many petroleum inspectors. It was the first portable electronic thermometer, PET, to challenge the long reign of the cup case thermometer. Although the TP-2 was severely dated by 1990, many inspectors wanted nothing else despite newer models by ThermoProbe and various competitors. Because the US market demanded the return of the venerable black box, ThermoProbe has put its newest circuit and software design into the old familiar form.

The TP2-C employs the proven RTD design that has been used in the TP7 and TP8 for many years. Where old mechanical switches were vulnerable to damage and liquid penetration, a sealed industrial quality overlay now provides a user interface that is easy to use with gloves. A sealed, heavy gauge powder coated aluminum enclosure replaces the vulnerable plastic case and protects the circuit board and large LCD from penetration by impact, water and reactive liquids.

The new TP2-C circuit board is an evolutionary step up from our highly accurate, reliable and successful TL-1 laboratory thermometer. The Power Button's primary function powers the instrument for intervals of about 20 minutes since the last button was accessed. The Power Button can also be used to conserve power and clear the memory, or to make adjustment while in calibration mode. A simple menu operation is displayed by holding the Function Button, and alternately functions to allow adjustments in the calibration mode. Arrows on the left side of the display show the direction of the temperature reading and whether stability has been reached. At the user's discretion stabilized temperatures can be logged at numerous liquid levels for a running average and later displayed for the user's documenting purposes. But this feature never interferes with simply getting an accurate temperature reading.

To endure the environment and be intrinsically safe, the TP2-C is manufactured of materials, which are both immune to petrochemicals and are non-sparking. The enclosure is made of aluminum with a thickness of 0.080 inches. The probe assembly is constructed with a static-dissipating, non-stick cable, with stainless steel sensor components.

Operational Attributes:

Easily replaceable AAA Batteries, provides an estimated *100 hours operation. Circuit logic automatically indicates low battery condition, automatically shuts off after twenty minutes, shows temperature trend and stabilization, displays error codes for failure determination. The low power backlight for night operation is photo sensor controlled for convenience and battery conservation. In nighttime conditions the backlight illuminates the display. Celsius or Fahrenheit units with C/F indication can be easily chosen from the Function Button. User Manual explains intuitive calibration procedure that can be done through the external faceplate buttons.

Includes:

- NIST traceable calibration certificate
- Limited Warranty

Product Overview

The **TP5-C** has all of the best qualities of the old TP-5 and incorporates the latest and most reliable technology into its electronics and probe assembly. Many customers have used the TP-5 over the years and have wanted to have a more robust and powerful version. You will truly appreciate the improvements found in the TP5-C.



The TP5-C employs the proven RTD sensor design that has been used in the TP7 and TP8 for many years. A sealed industrial quality overlay now provides a user interface that is easy to use with gloves. A sealed, anodized aluminum enclosure protects the circuit board and large LCD from penetration by impact, water, and reactive liquids. An auto-off feature has been added to save battery life.

The new TP5-C circuit board is an evolutionary step up from our highly accurate, reliable and successful TL-1 laboratory thermometer. The Power Button's primary function powers the instrument for intervals of about 20 minutes since the last button was accessed. The Power Button can also be used to conserve power and clear the memory, or to make adjustment while in calibration mode. A simple menu operation is displayed by holding the Function Button, and alternately functions to allow adjustments in the calibration mode. Arrows on the left side of the display show the direction of the temperature reading and whether stability has been reached. At the user's discretion stabilized temperatures can be logged at numerous liquid levels for a running average and later displayed for the user's documenting purposes. But this feature never interferes with simply getting an accurate temperature reading.

To endure the environment and be intrinsically safe, the TP5-C is manufactured of materials, which are both immune to petrochemicals and are non-sparking. The probe assembly is constructed with a static-dissipating, non-stick cable, with stainless steel sensor components.

Operational Attributes:

Easily replaceable AAA Batteries, provides an estimated *100 hours operation. Circuit logic automatically indicates low battery condition, automatically shuts off after twenty minutes, shows temperature trend and stabilization, displays error codes for failure determination. The low power backlight for night operation is photo sensor controlled for convenience and battery conservation. In nighttime conditions the backlight illuminates the display. Celsius or Fahrenheit units with C/F indication can be easily chosen from the Function Button. User Manual explains intuitive calibration procedure that can be done through the external faceplate buttons.

Includes:

- NIST traceable calibration certificate
- Limited Warranty
- ThermoTab Gauging Software for PalmOS

Specifications

Maximum Dimensions:	9.5"L x 7.2"H x 1.76" W
Temperature Range:	-40° to +400°F -40° to +204°C
Probe:	304 Stainless Steel, Sealant, Aramid Fiber Reinforced, FEP or PFA Cable Jacket, Coaxial Construction
Enclosure Material:	Anodized Aluminum Stainless Steel Fasteners
Batteries:	2AAA Alkaline; Duracell MX2400
Accuracy:	±0.2°F from -40 to 200°F ±0.5°F from 200 to 400°F 4 Point NIST Traceable Report of Test

**Specifications subject to change*

Certifications



UL
Listed for use in hazardous locations
Class I, Division 1, Groups A, B, C, D
Temperature Class T4
Complies to NFPA 70, NEC 501
See the UL website for more information



CE
0539
CONFORME
AUX NORMES
CEI/IEC 60074



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EEx ib IIB T4



Warning:

This device must be bonded (grounded) before and during introduction into the tank and remain bonded until complete withdrawal from the tank.

Typical Applications

Custody Transfers, Inventory, Tank, Pipeline, Barge, Ship, Railcar, Tank Truck. (Recommended Operation: API 7, Intl. Safety Guide For Oil Tankers and Terminals.)

Other Applications:	Proving Systems (API 4)
Materials:	All petrochemicals, caustic, acid, alkalies, powders. Molasses, syrups, distilled spirits.

Product Overview

The **TP7** has been developed for ease of use with its reel-case design. In addition to the case, the TP7 is designed to provide very high reliability, less maintenance, an extended temperature range, and high accuracy without a higher price. This has been achieved by utilizing a platinum RTD temperature sensor, using low power programmable electronics, improving the packaging and integrating field proven components. Other hardware items include the stretch cord grounding assembly and reel locking mechanism.



To endure the environment, the TP7 is manufactured of materials which are both immune to petrochemicals and are non-sparking. The enclosure is made of high impact plastic which dissipates static electricity and has proven to be tolerant to most petrochemicals, caustics or acids. As with all ThermoProbe instruments, the probe assembly is constructed with a very flexible, static-dissipating, aramid fiber reinforced, non-stick cable, and stainless steel sensor components. To ensure longevity of the user interface the faceplate is fabricated of engraved aluminum plate, a scratch resistant polycarbonate window and an O-Ring sealed switch.

Operational Attributes:

Easily replaceable 9V Battery, provides an average of 50 hours operation. If probe assembly replacement is necessary, the terminals allow simple connection of the wires. Circuit logic automatically indicates low battery condition, shows readout integrity before each operation, automatically shuts off after two minutes and displays error codes for failure determination. The low power backlight for night operation is photo sensor controlled for convenience and battery conservation. Celsius or Fahrenheit units with C/F indication can be easily chosen by an internal selector without recalibration.

Includes:

- NIST traceable calibration certificate
- Limited Warranty
- ThermoTab Gauging Software for PalmOS

Specifications

Maximum Dimensions:	13.5 x 7.25 x 4.5 in. 34.3 x 18.4 x 11.4 cm
Total Weight:	3 lbs with 75 ft. of cable 1.4 kg with 23m of cable
Battery Type:	9 volt Alkaline
Battery Life:	Approximately 50 hours
Case Materials:	Polypropylene Blend, Stainless Steel and Aluminum.
Limited Warranty:	90 days on Probe Assembly 1 year on other components
Probe:	Stainless Steel probe with static dissipating cable jacket and Aramid Fiber reinforcing for cut and smash resistance. Cable insulation are flouorocarbon polymers such as FEP, PFA, or similar materials. <ul style="list-style-type: none">• Standard lengths 50'/15m 75'/23m 110'/34m• Marked in 5 foot or meter increments
Temperature Range:	14 to 370F -10 to 188°C *Lower Range Available for Cold Climates

Accuracy:	$\pm 0.2^{\circ}\text{F}$ 0 to 200 $^{\circ}\text{F}$ $\pm 0.5^{\circ}\text{F}$ >200 $^{\circ}\text{F}$ $\pm 0.1^{\circ}\text{C}$ 0 to 100 $^{\circ}\text{C}$ $\pm 0.3^{\circ}\text{C}$ >100 $^{\circ}\text{C}$ Long term drift not to exceed 0.05%/year Probe Assembly exchangeable to within ± 0.2 @ 32 $^{\circ}\text{F}$, ± 0.6 @ 195 $^{\circ}\text{F}$. Meets API requirements.
Options:	<ul style="list-style-type: none"> • Extra Weight Probe • Asphalt Weight Probe • Extra Length Sensor • Railcar Sensor • Custom • Custom Temp. Ranges • Independent Lab Certification

Typical Applications

Custody Transfers, Inventory, Tank, Pipeline, Barge, Ship, Railcar, Tank Truck. (Recommended Operation: API 7, Intl. Safety Guide For Oil Tankers and Terminals.)


Other Applications:	Proving Systems (API 4) Metering Systems (API 5) Metering Systems (API 6)
Materials:	All petrochemicals, caustic, acid, alkalies, powders. Molasses, syrups, distilled spirits.

Certifications



Intrinsically Safe Thermometer
Class I, Div. 1, Groups ABCD
EEx ia IIB or EEx ia IIC

Warning:

 This device must be bonded (grounded) before and during introduction into the tank and remain bonded until complete withdrawal from the tank.



Product Overview

The **TP8** has been designed to be simple yet very versatile, with circuit and sensor components that are highly accurate and reliable over an extended temperature range. The instrument is compact, with cable storage, probe holders and handles molded into the case. Depending on the service which the user needs, the case will accommodate both our standard probe assembly or asphalt probe assembly. Models intended for asphalt and molten sulphur applications are designated with the part number suffix "AW". Other items include the coil cord grounding assembly, carry

strap and user instruction sheet. To endure the environment and be intrinsically safe, the TP8 is manufactured of materials which are both immune to petrochemicals and are non-sparking. The enclosure is made of extruded aluminum with a nominal thickness of 0.1"/2.5mm. As with all ThermoProbe instruments, the probe assembly is constructed with a very flexible, static-dissipating, aramid fiber reinforced, non-stick cable, and stainless steel sensor components. To ensure longevity of the user interface, all text is engraved, the window is a scratch resistant polycarbonate and the switch is O-Ring sealed.

Operational Attributes:

Easily replaceable 9V Battery, provides an average of 50 hours operation. Circuit logic automatically indicates low battery condition, shows readout integrity before each operation, automatically shuts off after two minutes and displays error codes for failure determination. The low power backlight for night operation is photo sensor controlled for convenience and battery conservation. Celsius or Fahrenheit units with C/F indication can be easily chosen by an internal selector without recalibration.

Includes:

- NIST traceable calibration certificate
- Limited Warranty
- ThermoTab Gauging Software for PalmOS

Specifications

Maximum Dimensions:	6.6 x 4.5 x 4.2 in. 16.7 x 11.4 x 10.7 cm
Total Weight:	3.7 lbs with 75 ft. of cable 1.7 kg with 23m of cable
Battery Type:	9 volt Alkaline
Battery Life:	Approximately 50 hours
Case Materials:	6063 - T6 Aluminum
Limited Warranty:	90 days on Probe Assembly 1 year on other components
Probe:	Stainless Steel probe with static dissipating cable jacket and Aramid Fiber reinforcing for cut and smash resistance. Cable insulation are flouorocarbon polymers such as FEP, PFA, or similar materials. Standard lengths 50'/15m 75'/23m 110'/34m Marked in 5 foot or meter increments <ul style="list-style-type: none"> • Standard weight probe 0.22 lb/ 0.1 kg cable 0.105" /2.6mm diameter • Asphalt weight probe 0.75 lb/ 0.34 kg cable 0.120 /3mm diameter, high temperature PFA jacket. • Railcar probe 0.25"/10mm diameter
Temperature Range:	14 to 370°F -10 to 188°C *Lower Range Available For Cold Climates

Accuracy:	$\pm 0.2^{\circ}\text{F}$ 0 to 200 $^{\circ}\text{F}$ $\pm 0.5^{\circ}\text{F}$ >200 $^{\circ}\text{F}$ $\pm 0.1^{\circ}\text{C}$ 0 to 100 $^{\circ}\text{C}$ $\pm 0.3^{\circ}\text{C}$ >100 $^{\circ}\text{C}$
	Long term drift not to exceed 0.05%/year Probe Assembly exchangeable to within ± 0.2 @ 32 $^{\circ}\text{F}$, ± 0.6 @ 195 $^{\circ}\text{F}$. Meets API requirements.

Certifications



Intrinsically Safe Thermometer

Class I, Div. 1, Groups ABCD

EEx ia IIB or EEx ia IIC

TIIS approved for Japan



Warning:

This device must be bonded (grounded) before and during introduction into the tank and remain bonded until complete withdrawal from the tank.

Typical Applications

Custody Transfers, Inventory, Tank, Pipeline, Barge, Ship, Railcar, Tank Truck. (Recommended Operation: API, Intl. Safety Guide For Oil Tankers and Terminals.)

Calibration:	Propane Meters Loading Rack Meters Computerized Tank Systems
Materials:	All petrochemicals, asphalt, (bitumen), molten sulphur, caustic, acid, alkalies, powders. Molasses, syrups, distilled spirits.