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The Temperature People ®
Since 1943

Accutherm®

Multiple Input Temperature Monitoring System

User Manual for ATK & ATJ

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INDEX

WARNING:
DO NOT ATTEMPT TO MEASURE LIVE CIRCUITS. FOR THIS APPLICATION, USE OUR GUARD-TEMP LINE OF NON-CONTACT INFRARED PYROMETERS

WARNING:
WHEN MEASURING HIGH TEMPERATURES, STANDARD SAFETY PRECAUTIONS MUST BE FOLLOWED:

1. USE INSULTATED FIREPROOF GLOVES
2. WEAR PROTECTIVE SHATTERPROOF FACE SHIELD
3. WEAR FIREPROOF PROTECTIVE CLOTHING WHEN WORKING WITH LIQUIDS.

WARNING:
WHEN MEASURING OPERATING MACHINERY, NEVER INSERT YOUR HANDS OR ARMS. USE CORRECT EXTENSION HANDLES AT ALL TIMES.

WARNING:
THESE INSTRUMENTS ARE NOT FOR USE IN HAZARDOUS (EXPLOSIVE) AREAS. FOR HAZARDOUS (EXPLOSIVE) OPERATION, USE OUR LINE OF ACU-THERM ANALOG INSTRUMENTS.

WARNING:
THESE INSTRUMENTS ARE DESIGNED AND BUILT FOR TEMPERATURE MEASUREMENT. ANY OTHER USE VOIDS THEIR INTENDED PURPOSE

Notes

ACU-THERM Digital is a high performance, high accuracy, hand held portable industrial pyrometer.

ACU-THERM Digital features industrial ruggedness, but is equally respected by industry and laboratories for its initial accuracy and the fact that it is made to stay accurate. ACU-THERM Digital is guaranteed for 3 years, because it has a performance proven track record since 1976, and because ACU-THERM Digital is built with the highest quality components, plus our sincere desire to bring to you a pyrometer you can always depend on.

REMEMBER … Temperature measurement accuracy **ALWAYS BEGINS WITH THE SENSOR.**

The most accurate pyrometer cannot compensate for sensor error. We strongly recommend using EDL assured accuracy sensors. These sensors are hand-crafted. They are made in all styles, and are designed and produced to give you accuracy as close as 1°f or 1°c.

CAUTION … never use a sensor for any other purpose than the designed purpose, if you expect to obtain its full accuracy ability.

Since temperature measurement accuracy always begins with the sensor, EDL has made every effort to create a sensor and lead assembly that assures the best possible temperature measurement accuracy.

Other products:
EDL manufactures a full line of standard thermocouple sensors for measuring gas temperatures, liquids, smooth flat surfaces, contoured surfaces, rough surfaces, fins, radiators, performs, ovens, steam traps, concrete, asphalt, plastics, rubber, molds, and most other industrial measurement applications. Our engineers welcome the opportunity to quote on your special application.

We also manufacture a variety of hand-held portable instruments such as: Pocket-Probe Analog … housed in a rugged steel case, available in four models and 18 temperature ranges, thermocouple type E, 5.5” x 3.9” x 2.1” , 22 oz. Pocket-Probe Digital, The industrial workhorse, available in 5 thermocouple types and 9 temperature ranges, housed in an indestructible steel case, 5.5” x 3.9”x 2.1” , 27 oz. Dyna-Temp Digital, available in 5 thermocouple types and 11 temperature ranges. 5 3/16” x 3” x 1 1/8”, 8.5 oz.
Acu-Probe digital, a small rugged low cost instrument reading degrees F or C, available in 5 thermocouple types and 6 temperature ranges, housed in a stylish aluminum case, 5 1/4” x 1 3/4”x 1”, 6.2 oz. E-Z Probe Digital, our lowest cost instrument, available in type K only, with 2 temperature ranges and housed in a reinforced plastic case that is impact, chemical, and temperature resistant, 4.7” x 2.7” x 1”, 6.3 oz.

In addition, we manufacture temperature controllers, temperature scanners, water detectors, temperature alarms, panel instrumentation, infrared (Non-Contact) pyrometers, thermocouple references, calibrators, temperature sensitive labels, inks, crayons and other specialty items.

Use A Good Grade Battery

High performance instruments require good batteries. The live for carbon-zinc batteries is generally less than 1/2 of alkaline batteries. EDL advises against the use of carbon-zinc batteries for instrument use, because there are numerous grades which vary in life expectancy by as much as 30%. Only one standardized grade of alkaline batter is made, regardless of the manufacturer. Carbon-zinc batteries are more subject to leakage and have a poor shelf live compared to alkaline batteries which have a very long shelf live. Alkaline batteries give you the best buy for instrument use.

Note … Batteries should be replaced every 12 months regardless of their condition. Failure to follow this schedule can result in leakage that could damage instrument.

Battery Replacement Procedure - 9 Volt

The battery compartment is located at the bottom of the instrument panel. Press in and lift the battery cover. When the lock disengages, pull the cover upward. The battery cover will then com out easily. Observe the positioning of all components, including wires. Take the battery out and disengage the clips. Put the clips onto the new battery. Put the battery into the compartment in the same manner as removed. Be sure the engage the slip-fit end of the cover onto the chasis.

Rugged, Protective … Industrial Steel Case and Cover

The display is protected by a 1/16" thick tempered glass window, which is chemical resistant, scratch resistant and virtually indestructible. This offers excellent display visibility and gives you effective protections against all types of common abuses and hazards.

The industrial steel case provides a general barrier against magnetic and electrostatic conditions, plus real physical protection against all realistic industrial abuses and brutalities. This steel case permits you to use Accutherm where there is the possibility of dropped tools and objects, solder splashing, liquid spills, etc.

Instruments with Peak Hold … option

Peak Hold operates when the N-P switch is in the P position. The instrument will effectively sense and display all temperatures that are increasing. As peak temperatures are sensed, they are held and the highest temperature will continue to be displayed after the sensor is removed from the temperature under test.

- Instruments containing a color code in the battery compartment cover window must be used only withy sensors which bear the identical color code.

- There are **no exceptions …** Any attempt to use a standard sensor with a specially calibrated instrument will result in erroneous readings.

Diagnostic accuracy self test … option

Before you activate the self test circuit, make sure that the peak hold switch is in the (N) position. Disregard comments relating to peak hold for instruments which do not have the peak hold feature. Push the small red button located at the top of the instrument above the display. This circuit will only affect the instrument while the button is held down. When self test circuit is activated, on the instruments that have a full scale range below 1800° , the instrument will read 1000° F or 537° C+/- 1° on the display. On instruments that have full scale ranges above 1800°, the readings will be 1900° F or 1037° C +/- 1°. Thermocouple calibration does not affect the diagnostic circuit reading. An instrument which gives you the readings is within the specified accuracy. If the instrument fails this test, the discrepancy in the reading is the error of the instrument

Should your instrument fail the diagnostic accuracy test at any time: first replace the battery. If the battery replacement does not correct the condition, then the instrument requires recalibration. Return the instrument directly to our service department for recalibration.

Thermocouple selector switch

This switch allows you to choose which thermocouple input is being monitored. To change inputs merely rotate the switch to the desired input number. This switch is designed for extremely high use and long rotational life.

Tempered Glass Display Window

This tempered glass window allows you to use Accutherm digital in many environments where the usual plastic display windows would become scratched or crazed and would have diminished visibility. Tempered glass is able to withstand chemicals, splashed solder, and dusty or gritty environments. This tough glass display window does not get hazy, it is scratch proof and it is easily cleaned to assure perfect visibility.

To operate Accutherm digital for non-peak readings, simply move the N-P switch to the normal (N) position. The instrument will then track and display increasing and decreasing temperatures as detected by the sensor.

Peak Hold Memory

The unique memory feature holds peak reading values after the instrument is turned off. When you desire to use the peak hold memory, simply turn the instrument off, but leave the peak hold switch in the (P) position

Peak hold memory also eliminates the possibility of losing a peak value if the instrument is accidentally turned off. In order to recall a peak value, merely turn the instrument on. The memory only be erased by moving the peak hold switch to the (N) position which turns the peak hold circuit off.

Accutherm Digital peak hold depreciation or droop rate is about 1° per 1.75 minutes (1° per 105 seconds) as opposed to competitive instruments which depreciate 1° per 10 to 45 seconds. It is recommended that the depreciation rate be checked for you particular Accutherm digital instrument. In many instances the depreciation time could be 1.75 minutes for the first 1° and as much as 5 to 20 minutes for each successive degree. The time required for a peak hold reading to be held is 3/4 of a second (750 milliseconds). This is the peak hold acquisition time. A very fast acquisition time of 100 milliseconds can be.

High Visibility Display

The Acutherm Digital liquid crystal display has excellent visibility in any light which ranges from dim interiors to bright sunlight. The brighter the light, the brighter the display.

The display is quite visible even in photographic darkroom red light. Often measurements must be made in totally dark locations, the same amount of light which is needed to see where and how to apply the sensor, is ample light to see the display.

Where a lighted display is needed, Acutherm digital instruments are available with display back lighting.

In addition to its high visibility, the display is capable of operating over a very wide range of ambient temperatures … -20° F to +195° F.

Display Back Lighting

The electro luminescent lamp can be illuminated only when the rocker thumb switch is pressed for momentary display readings.

Low Battery Alert

A low battery alert is provided to prevent accidental or unexpected battery depletion. When the "**LO BAT**" symbol appears on the display, it indicates that there is approximately 50 hours of continuous battery life remaining. When "**REP BAT**" appears on the display, there is approximately 10 hours of battery life left. We recommend changing the battery at this time, since low battery voltage can cause a properly working instrument to appear as though it were defective, therefore, do not return an instrument for repair, unless you have installed an new battery. This will determine whether the battery or the instrument is at fault.

Sensor Versatility—Version (B) Instruments

Because Accutherm Digital is an exceptionally stable and versatile high reliability pyrometer, you can use any style sensor, any sensor length, any lead length, any diameter, all variations and combinations in lead or sensor length up to 1000 feet, causes no errors.

Suggested One Year Battery Replacement Schedule

Any battery which is 1 year old, should be replaced, regardless of how good the battery appears, or how little battery was used. A battery which is more than a year old, may appear to be good, but it could develop leakage that can easily harm instrument components. Created a dating and maintenance schedule which automatically assures battery replacement at 1 year intervals.

To obtain maximum battery life, apply the sensor to the object under test and allow ample time for the sensor to reach the temperature of the test object, them depress the momentary ON switch to obtain the temperature reading. This method of temperature measurement limits the time required for the display and light to be ON for only 5 to 10 seconds per temperature reading.

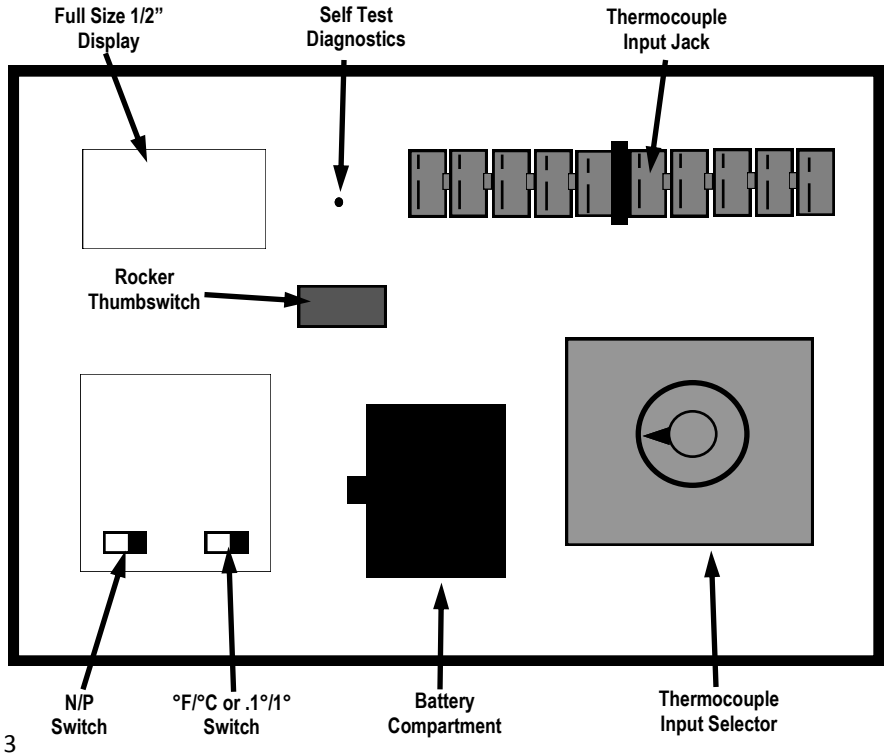
The display back lighting system is by an electro luminescent panel. This panel operates off the 9 volt battery powering the instrument.

When back lighting is required, use the momentary position of the rocker switch. The display is not brightly illuminated, to avoid heavy current drain on the battery. If back lighting is used continuously, the battery life will be approximately 30 to 40 hours. Therefore, we recommend using back lighting only when necessary

Version (A) Pyrometers - High Accuracy - Color Coding

Version (A) instruments employ pre calibrated matched sensors which provide the ultimate in total temperature measurement accuracy, for instrument plus sensors. Accuracy as close as 1° is achievable with almost any sensor style.

Where special sensors of any nature are supplied, such sensors bear a color code on the plug. These special sensors must be used only with the specially calibrated instrument that also bears the identical color code which appears in a window in the battery compartment cover.



Specifications

Display: 1/2" Tall, bright liquid crystal display-
Compensation: Automatic cold end and ambient
Resolution: 0.1°F or 1/2°F and 0.1°C or 1°C
Repeatability: 1/2°F or 1/2°C
Sensor Resistance: 1,000 Ohms Maximum
Dependability Burn-In: 168 Hours Minimum
Circuitry: Ultra Stable EDL and State of the art, with CMOS Digital Logic.
Input: 5, 10, or 20 polarized Miniature Thermocouple jacks. Accepts standard miniature plugs.
Separate Battery Compartment: Requires NO TOOLS for battery replacement.
Battery: Standard 9 volt transistor radio battery. Supplied with instrument.
Battery Life: Up to 1,200 hours continuous use time. 1 year actual intermittent use time. Approx. 880,000 five second readings or 220,000 twenty second readings.
Battery Condition Indicator: Displays LOW BAT & REP BAT.
Open (Sensor) Probe: Version "A"—– Displays room temperature. Version "B" —– Displays random negative reading.
Peak Hold with Memory: Holds and displays highest temperature sensed. Memory function.
Peak Hold Droop Rate: 1° maximum change per minute. Typical 1° change per 1.75 minutes after highest temperature is sensed.
Peak Hold Acquisition Time: Approx. 3/4 second 100 millisecond acquisition time available
Steel Case & Cover: Removable cover with thick glass window.
Tested Ambient Operating Range: +40°F to +120°F (4°C to 50°C) +/-1° over this ambient Range.
Usable Ambient Temperature Range: -20°F to +150°F (-30°C / 65°C)
Storage Temperature: -67°F to +194°F (-55°C to +90°C)
Temperature Ranges: -280°F to + 2000°F & Centigrade equivalent for all ranges.
Accuracy: Base Accuracy is … 1°, 1/10%, or 0.25% of reading… depending on model. See price and accuracy chart on page 17.
Operating Adjustments: None
Instrument Types: K, J, E, T, or N
Response Time (Update): 3 Per second.
Linearization: continuous
Weight: 2 Lbs. 14 Oz.
Dimensions: 5.5" x 9" x 2.5"

Instruments with °F and °C
Move the F-C switch to the desired position.

Apply the sensor to the object under test and read the temperature. When continuous on readings are made, always turn the instrument off upon completion of readings … especially at the end of the day, to avoid accidental battery depletion during storage.

Resolution

Please refer to the diagram on page 3 for all instruments with 0.1° resolution. The choice of .1° or 1° can be made at any time and in any mode of operation. 0.1° resolution operates up to a maximum of 199.9 °F/°C.

Open Thermocouple Indication

When a sensor is either open or not plugged into a version B instrument, an open thermocouple connection will be displayed as a negative reading … -300 or below, such as -402, -1566, etc.

Parts and Service
Order spare or replacement sensors from local distributors or directly from our laboratories. Also specify lead length if it is special, or any other notations or color code appearing in the battery cover window.

Do Not Attempt To Perform Any Repairs On The Instrument. Our knowledge of the entire instrument prepares us for fast, simple, and low cost repairs, tampering could cause additional problems.

Be sure to place the instrument in a corrugated container, with ample packing to prevent further damage in shipment. Label the package fragile, handle with care, and insure for full purchase price value. We will not accept any responsibility for damages or loss in transit.

Important -Give specific details as to the nature of the problem and service required. In may instances, this information is very helpful in restoring the instrument to perfect operating condition rapidly and at lowest cost

Important -Do not return an instrument for repair, unless you have installed a new battery to determine whether the new battery restores instrument to its proper working condition

Note- Sensors are made for operation up to specific maximum temperature. When ordering spare or replacement sensors, be sure to mention the full scale temperature of the instrument. Also be sure to state the temperature value printed or stamped on any sensor

Range Code Model	T/C	Resolution	Temperature Range	Accuracy ± 1 Digit
223	K	1°F 1°C	-30° to +700°F -35° to +375°C	@-30°F - 3°, @35°C - 2°, 0° to 600°F & -20° to +320°C-1° @+700°F-3°, +375°C –2°
245	K	1°F 1°C	-30° to +1800°F -35° to +985°C	@ -30°F-3°, @-35°C –2° 0° to +800°F & -20° to +425°C-1° +850° to +1700°F & +450° to +925°C-.5% @ 1800°F & +985°C -1% of reading
323	K	1°F 1°C	-280° to +1500°F -100° to +815°C	-280° to +1500°F & -100° to +815°C-1°
361	K	.1°F 1°C	-170.0° to +199.9°F -0° to +2000°F	-170.0° to +199.9°F –.5°F 0° to +2000°F -1°F
367	K	1°F 1°C	-280° to +2000°F -100°+1200°C	-280° to +2000°F & -100° to +1200°C-1°
441	J	.1°F 1°F	-170.0° to +199.9°F 0° to +1100°F	-170.0° to +199.9°F –.5°F 0° to +1100°F -1°F
445	J	1°F 1°C	-280° to +1100°F -100° to +620°C	-280° to +1100°F & -100° to +620°C-1°
50	T	1°F	-100° to +752°F	-100° to +752°F -1°F
60	E	1°F	-100° to +1500°F	-100° to +1500°F -1°F
80	N	1°F	-100° to +2000°F	-100° to +175°F-1°F & +200° to +950°F-3°F +1000° to +2000°F-.5% of reading

All EDL sensor leads are made from the same high quality thermocouple wire used in the sensor heads. Extension wire is inferior, and is never used. The thermocouple wire used for leads always insures the best possible accuracy, even under the most adverse conditions. Therefore, in situations where the lead wire is exposed the high temperatures, there is no effect upon the accuracy of readings. Our standard Teflon insulation is usable up to 550°F.

The first letter in the model code # … A or B … indicates whether your instrument is an … (A) version or (B) version. The (B) version instrument can be used with any sensor, or any lead length, provided the thermocouple calibration types match. Version (A) instruments require special calibration for linger than standard sensors or leads. See Page 10 for more information relating to version (A) instruments.

Important

Accutherm digital pyrometers are made in five thermocouple calibrations: Types K, J, E, and N. In accordance with the pyrometer industry standards, each thermocouple type is designed by the following specific colors for both plugs and jacks:

K = Yellow … J = Black … E = Purple … T = Blue… N = Orange

Caution: Never use an instrument and a sensor which have different jack and plug colors. **There are no exceptions to this caution.**

For your ordering convenience … For technical assistance … For any problems encountered in the operation of your instrument or sensor. Please call on our Toll Free Number 1-800-342-5335 or 1-434-799-0807.

Unconditional Guarantee

EDL unconditionally guarantees to repair or replace any components, at no cost, if this Accutherm Digital pyrometer exhibits any malfunctions resulting from any defects in materials or workmanship during the period specified on your guarantee card. Fill out guarantee card and mail promptly to assure receiving full warranty benefits.

Switching

All Accutherm Digital pyrometers have a thumb activated switch with 3 positions, Momentary On, Off, and Continuous On.

Additional switches are provide on instruments which have specific feature options.

1.-Peak Hold
2.-°F and °C
3.-0.1° and 1°
4.-Peak hold reset
5.-Display lighting
6.-Self diagnostic test

The rocker thumb switch must be pressed for continuous on or momentary on to display readings.

Use the continuous on postion only where long duration tests arte needed. When the thumb switch is in the continuous on position, the display reading will remain on until the rocker thumb switch is returned to the center off position.

To operate Accutherm Digital

Insert polarization sensor plug into the matching color polarized instrument jack. Press the thumb switch to momentary on or continuous on operation. The display will indicate approximate room temperature (exact room ambient readings depend upon sensor type and location). The instrument is ready for temperature measurement.