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UT300S
Infrared Thermometers Operating Manual

OVERVIEW

UT300S non-contact Infrared Thermometer (hereinafter referred to as "thermometer") is capable of confirming the surface temperature by measuring infrared energy radiated from the target surface.

UT300S non-contact infrared thermometer is intelligently designed with ultra-low power consumption, which ensures long-term operation, saves user from frequent replacement of battery and the worry from under-voltage at work. Intelligent design facilitates testing, quicker capturing of the true value of measured object.

SAFETY INSTRUCTION

⚠ **Warning:**

● To avoid electric shocking or personal injury, please follow the following instructions:
● Do not direct laser at eyes or on indirect reflection surface.
● Prior to use the thermometer, please check the box. If any damage to the thermometer were found, please do not use it. Inspect for damage or any shortage of plastic parts.
● Replace the battery immediately once the battery indicator " 🔋 "appears.
● Do not use the thermometer in case of any abnormality, as the protection may be damaged and affected. In case of any doubt, please deliver the thermometer for maintenance.
● Do not use the thermometer near the explosive gas, steam or dust.
● To avoid scorching, it is necessary to remember that the object with high reflection rate will normally cause the measured temperature value lower than the actual temperature.
● The equipment protection may be degraded in case of failure to use the equipment as per the manual.

CAUTION
AVOID EXPOSURE-LASER RADIATION IS EMITTED FROM THIS APERTURE
LASER RADIATION-DO NOT STARE INTO BEAM
COMPLIES WITH EN61326-1 EMC/EN60825-1 Safety
OUTPUT<1mW WAVELENGTH 630-670nm
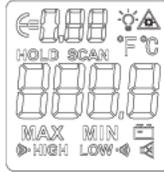CLASS 1 LASER PRODUCT

Caution

To avoid any damage to the thermometer or measured device, please protect them from following damages:
● EMF from electric welder, electro-induction heater;
● Static electricity;
● Thermal shock (caused by larger or abrupt environmental temperature- wait 30min to allow the thermometer stable).
● Do not allow the thermometer running all the way or near any object with high temperature.

FEATURES

Single-point laser aiming.
White backlight.
Synchronous display of the measured maximum or minimum value.
Option of Celsius/Fahrenheit.
Dynamic monitoring of battery capacity.
Low voltage indication.
Display screen.
Adjustable emissivity.
Sound alarm for the upper and lower temperature limit.

∈=	Emissivity display
▲	Laser
SCAN	Scan
HOLD	Hold
MAX MIN	Maximum or minimum value
🔋	Battery capacity indication
☼	Backlight indication
℉℃	Celsius/Fahrenheit
▶ HIGH LOW ◀	Sound alarm for the upper and lower temperature limit

To avoid any damage to the thermometer or measured device, please protect them from following damages:

WORKING PRINCIPLE

Infrared thermometer can measure surface temperature of opaque objects. Its optical device can sense the infrared energy concentrated on the detector, and the electronic components convert information into temperature reading which is displayed on the display screen. Laser is only used for aiming the target object.

OPERATING METHODS

To measure temperature, allow the thermometer aim at the measured target, push the trigger to display the real time measured result; and loose the trigger to hold it. MAX/MIN is off when the middle button is pressed. Thermometer will automatically shut down if no action were detected out within 8s. The ratio of distance to light spot size and the field of view must be allowed for. Laser shall be only used to aim at target object.

SETTING OPERATION:

SET:
Cyclical switching setting status: Click on SET to enter the cyclical switching setting status, which is designed with a circular order as follows: emissivity setting →℃/℉ setting →temperature limit value mute setting →high temperature limit value setting →low temperature limit value setting. Under different setting status, the corresponding icon will flash, and with a 2s long press on SET, quit the setting status.

After operation, "MAX/MIN" will be "▼", and "℉/▲" will be "▲". When failure to perform the user setting, they would be displayed as "MAX/MIN" and "℉/▲".

Emissivity setting:
It is used to change the emissivity value. E= will flash during setting, click on "▲" with a progressive increase of 0.01 and rapid increase with a long press until up to 1.00; while click on "▼" with a progressive decrease of 0.01 and rapid decrease with a long press until down to 0.1.

℃/℉ setting:
It is used to display ℃ or ℉. The set unit ℃ or ℉will flash; click "▲" or "▼" to select ℃ or ℉ in cycle.

Temperature limit value mute setting:

It is used to set the sound on/off for measured temperature exceeding high or low temperature limit value. When setting, the " ◀ " will flash. It is able to select mute on/off in cycle by clicking on "▼" or "▲". When the mute setting is on, it will be displayed as "HIGH LOW", and the buzzer will be mute in case measured temperature exceeds the high or low temperature limit value; while mute setting is off, it will be displayed as ▶ HIGH LOW ◀ "and buzzer will make sounds intermittently in case measured temperature exceeds the high or low temperature limit value.

HIGH limit value setting:

It is used to set the high limit value and the buzzer will make intermittent sounds when measures temperature is higher than the set value. Press " SET " to switch to the flashing " HIGH ". When clicking on "▲" , the value will increase by 0.1 in progression and it will increase rapidly after a long press, and then a sound will be heard when up to the highest value; When clicking on "▼" , the value will decrease by 0.1 in progression and it will increase rapidly after a long press, and then a sound will be heard when down to the lowest measured temperature value or equivalent to the LOW limit value. When " ◀ " is flashing, it is allowed to set /cancel the function, and the function will be effective when " ▶ HIGH" is displayed.

LOW limit value setting:

It is used to set the low limit value and the buzzer will make intermittent sounds when measures temperature is lower than the set value. Press "SET" to switch to the flashing "HIGH". When clicking on "▲" , the value will increase by 0.1 in progression and it will increase rapidly after a long press, and then a sound will be heard when up to the highest value; When clicking on "▼" , the value will decrease by 0.1 in progression and it will increase rapidly after a long press, and then a sound will be heard when down to the lowest measured temperature value. When ◀ " is flashing, it is allowed to set/cancel the function, and the function will be effective when "LOW ◀ " is displayed.

FIND OUT THE HOT OR COLD POINT

To find out the hot or cold point, aim the thermometer at the region beyond the target, scan up and down the whole region slowly until find out the hot or cold point.
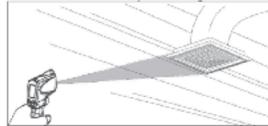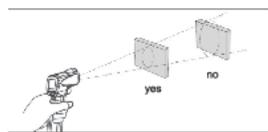
DISTANCE AND SPOT SIZE

With the increasing distance (D) from the measured target, the spot size (S) in the measured region (100℃) will also increase. Spot size represents 90% of the energy in the circle. The maximum D:S will be obtained when the distance between the data recorder and target, and the spot size of 50mm (2in) is generated.

D:S=12:1
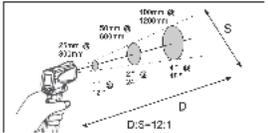
FIELD OF VIEW

It is necessary to ensure the size of target larger than the spot size. The smaller the target, the closer the distance should be. The measurement distance is recommended to be 75% less than the theoretical value.

yes   no

EMISSIVITY

Emissivity represents the energy emission of material. Most of organic materials and painted or oxidized surface have the emissivity of about 0. 95. If possible, masking tape or Berlin black< 150℃ /302℉) should be applied to cover the measured surface and the high-emissivity device should also be used, as the metal surface with compensated light measurement may cause error reading. Wait a period of time to allow the tape or oil stain share the same temperature with that of surface of the covered object. Measure the temperature of surface covered with tape or paint.

● MAINTENANCE

Clean lens
Blow away the slipped off grains with clean compressed air. Wipe the surface carefully with wet cotton swab. Cotton swab should be moistened with clean water.

Clean chassis
Clean the chassis with cotton sponge or soft cloth with soap water or clean water.
To prevent thermometer from damage, do not soak the meter into water.

● FAULT DIAGNOSIS

Symptom	Problem	Action
OL (on the display screen)	Target temperature exceeding range	Select the target within range
-OL (on the display screen)	Target temperature lower than range	Select the target within range
Battery indication icon flashes	Battery low	Replace battery
Possible blank display screen	Depletion of battery capacity	Check and /or replace battery
Laser fails to work	1. Battery low or depletion 2. Environmental temperature higher than 40℃ (104℉).	1. Replace battery 2. Applicable to regions with low temperature.

● CE CERTIFICATION

The thermometer complies with following standards:
EN61326 2006
EN60825-1 1994+A2 2001+A1 2002 Laser Safety Standard

SPECIFICATION

Function	UT300S
Temperature range	-32℃~400℃/-25.6℉~752℉
Accuracy	±2℃or 2 % (Ambient temperature: 23℃±2℃)
Repeatability	<±0.5℃ or <±0.5%
Resolution	0.1℃ / 0.1℉
Distance to Spot Size	12:1
Response time	500mSec
Emissivity	0. 10~1. 00. adjustable
Laser Type	Class 2(II)
Laser Power	<1mW
Laser Wavelength	630nm~670nm
Spectral Response	8um~14um
℃/℉ option	√
Able to shut down laser	√
Display Hold	√
Auto Shutdown	√
Low Battery Indication	√
MAX Mode	√
MIN Mode	√
High Alarm	√
Low Alarm	√
White backlight	√

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UT300S Infrared Thermometers Operating

Manuals+

Overview

The UT300S non-contact Infrared Thermometer is designed to measure surface temperature by detecting infrared energy radiated from a target. It features ultra-low power consumption for extended operation and an intelligent design for quick and accurate readings.

Safety Instructions

⚠️ **Warning:** To avoid electric shock or personal injury, please follow these instructions:

- Do not direct the laser at eyes or on indirect reflection surfaces.
- Before use, inspect the thermometer for any damage. Do not use if damaged.
- Replace the battery immediately when the battery indicator [battery low] appears.
- Do not use the thermometer if it shows any abnormality, as its protection may be compromised. For maintenance, contact the manufacturer.
- Do not use near explosive gas, steam, or dust.
- Be aware that objects with high reflectivity may yield lower temperature readings than the actual temperature.
- Improper use may degrade the equipment's protection.

To avoid damage to the thermometer or the measured device, protect them from:

- Electromagnetic fields (EMF) from electric welders or induction heaters.
- Static electricity.
- Thermal shock (sudden environmental temperature changes). Allow 30 minutes for stabilization.
- Do not operate near objects with extremely high temperatures.

Working Principle

Infrared thermometers measure the surface temperature of opaque objects by sensing emitted infrared energy. An optical device concentrates this energy onto a detector, which is then converted into a temperature reading displayed on the screen. The laser is used solely for aiming at the target.

Operating Methods

Aim the thermometer at the target. Push the trigger to display the real-time temperature. Release the trigger to hold the reading. The MAX/MIN function is accessed by pressing the middle button. The thermometer automatically shuts down after 8 seconds of inactivity. Ensure the distance-to-spot size ratio and field of view are appropriate for the target.

Setting Operation

SET Button Functionality

Pressing the SET button cycles through various settings: Emissivity, °C/°F selection, temperature limit mute, high temperature limit, and low temperature limit. The corresponding icon will flash during setting. Pressing and holding SET for 2 seconds exits the setting mode.

After operation, "MAX/MIN" will be displayed as [Max/Min icons], and "▲" will be displayed as [Up arrow icon]. If user settings fail, "MAX/MIN" and "▲" will be displayed.

Emissivity Setting

Adjusts the emissivity value (E=). The E= value flashes during setting. Use the [increase] button to increase emissivity by 0.01 (rapid increase with long press) up to 1.00. Use the

°C/°F Setting

Selects the temperature unit (°C or °F). The selected unit will flash. Press [increase] or [decrease] to cycle between °C and °F.

Temperature Limit Value Mute Setting

Controls the audible alarm for high or low temperature limits. The [mute] icon will flash. Select mute ON/OFF using [increase] or [decrease]. When mute is ON, the display shows "[High/Low alarm active]". When mute is OFF, it shows "[High/Low alarm active]" and the buzzer sounds intermittently.

High Limit Value Setting

Sets the upper temperature limit. The buzzer sounds when the measured temperature exceeds this value. Press SET to select "HIGH". Use [increase] to raise the value by 0.1 (rapid increase with long press) and [decrease] to lower it. When the [High limit active] icon flashes, the function is active.

Sets the lower temperature limit. The buzzer sounds when the measured temperature falls below this value. Press SET to select "LOW". Use [increase] to raise the value by 0.1 (rapid increase with long press) and [decrease] to lower it. When the [Low limit active] icon flashes, the function is active.

Finding the Hot or Cold Point

To locate hot or cold spots, aim the thermometer at an area beyond the target and slowly scan up and down the entire region.

Distance and Spot Size

As the distance (D) from the target increases, the spot size (S) of the measurement area also increases. The spot size represents 90% of the energy within the measured circle. The maximum D:S ratio is achieved when the distance allows for a 50mm (2-inch) spot size. The ratio is 12:1.

Diagram Description: A visual representation shows a thermometer emitting a beam. Circles of increasing size represent the measurement spot at different distances: 25mm spot at 300mm distance, 50mm spot at 600mm distance, 100mm spot at 1200mm distance. The distance-to-spot size ratio is indicated as D:S=12:1.

Field of View

It is crucial that the target size is larger than the measurement spot size. For smaller targets, the measurement distance should be closer. A recommended measurement distance is 75% of the theoretical value to ensure accuracy.

Diagram Description: Two scenarios are depicted. The first shows a target that is larger than the thermometer's beam, labeled "yes". The second shows a target smaller than the beam, labeled "no", indicating it's not suitable for accurate measurement.

Emissivity

Emissivity quantifies a material's energy emission. Most organic materials and oxidized surfaces have an emissivity of approximately 0.95. For surfaces with low emissivity (like metal), using masking tape or a special black coating (e.g., Berlin black) can improve accuracy. Allow time for the tape or coating to reach the target's temperature before measuring. Measure the temperature of the surface covered by the tape or paint.

Maintenance

Clean Lens

Use clean compressed air to blow away loose particles. Gently wipe the lens with a damp cotton swab moistened with clean water.

Clean Chassis

Clean the thermometer body with a cotton sponge or soft cloth using mild soap and water. Do not immerse the thermometer in water to prevent damage.

Fault Diagnosis

Symptom	Problem	Action
OL (on the display screen)	Target temperature exceeding range	Select the target within range
-OL (on the display screen)	Target temperature lower than range	Select the target within range
Battery indication icon flashes	Battery low	Replace battery

Symptom	Problem	Action
Laser fails to work	1. Battery low or depletion 2. Environmental temperature higher than 40°C (104°F)	1. Replace battery 2. Applicable to regions with low temperature.

CE Certification

[CE certified] The thermometer complies with the following standards: EN61326 2006, EN60825-1 1994+A2 2001+A1 2002 Laser Safety Standard.

Specifications

Function	UT300S
Temperature range	-32℃~400℃/-25.6°F~752°F
Accuracy	±2°C or 2% (Ambient temperature: 23℃±2℃)
Repeatability	<±0.5°C or <±0.5%
Resolution	0.1℃/0.1°F
Distance to Spot Size	12:1
Response time	500mSec
Emissivity	0.10~1.00, adjustable
Laser Type	Class 2(II)
Laser Power	<1mW
Laser Wavelength	630nm~670nm
Spectral Response	8um~14um
°C/°F option	✔
Able to shut down laser	✔
Display Hold	✔
Auto Shutdown	✔
Low Battery Indication	✔

Function	UT300S
MIN Mode	✔
High Alarm	✔
Low Alarm	✔
White backlight	✔

Manufacturer Information

UNI-TREND TECHNOLOGY (CHINA) CO., LTD.

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Models: UT300S, Infrared Thermometer, UT300S Infrared Thermometer, Thermometer

Full PDF Document

PN:110401105P15X DATE:2015.06.26 REV.1

UT300S
Infrared Thermometers
Operating Manual

Caution

CAUTION
AVOID EXPOSURE-LASER RADIATION
IS EMITTED FROM THIS APERTURE

LASER RADIATION-DO NOT STARE INTO BEAM
COMPLIES WITH EN61308-1 EMC/EN60825-1 Safety
OUTPUT:<1mW WAVELENGTH 630-670nm
CLASS 1 LASER PRODUCT

OVERVIEW

UT300S non-contact Infrared Thermometer (hereinafter referred to as "thermometer") is capable of confirming the surface temperature by measuring infrared energy radiated from the target surface.

UT300S non-contact infrared thermometer is intelligently designed with ultra-low power consumption, which ensures long-term operation, saves user from frequent replacement of battery and the worry from under-voltage at work. Intelligent design facilitates testing, quicker capturing of the true value of measured object.

SAFETY INSTRUCTION

⚠ **Warning:**

● To avoid electric shocking or personal injury, please follow the following instructions:
● Do not direct laser at eyes or on indirect reflection surface.
● Prior to use the thermometer, please check the box. If any damage to the thermometer were found, please do not use it. Inspect for damage or any shortage of plastic parts.
● Replace the battery immediately once the battery indicator "🔋" appears.
● Do not use the thermometer in case of any abnormality, as the protection may be damaged and affected. In case of any doubt, please deliver the thermometer for maintenance.
● Do not use the thermometer near the explosive gas, steam or dust.
● To avoid scorching, it is necessary to remember that the object with high reflection rate will normally cause the measured temperature value lower than the actual temperature.
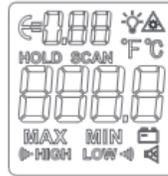● The equipment protection may be degraded in case of failure to use the equipment as per the manual.

To avoid any damage to the thermometer or measured device, please protect them from following damages:
● EMF from electric welder, electro-induction heater;
● Static electricity;
● Thermal shock (caused by larger or abrupt environmental temperature- wait 30min to allow the thermometer stable).
● Do not allow the thermometer running all the way to allow any object with high temperature.

FEATURES

Single-point laser aiming.
White backlight.
Synchronous display of the measured maximum or minimum value.
Option of Celsius/Fahrenheit.
Dynamic monitoring of battery capacity.
Low voltage indication.
Display screen.
Adjustable emissivity.
Sound alarm for the upper and lower temperature limit.

🔋	Emissivity display
⚠	Laser
SCAN	Scan
HOLD	Hold
MAX MIN	Maximum or minimum value
🔋	Battery capacity indication
☼	Backlight indication
℉℃	Celsius/Fahrenheit
▶HIGH LOW◀	Sound alarm for the upper and lower temperature limit

WORKING PRINCIPLE

Infrared thermometer can measure surface temperature of opaque objects. Its optical device can sense the infrared energy concentrated on the detector, and the electronic components convert information into temperature reading which is displayed on the display screen. Laser is only used for aiming the target object.

OPERATING METHODS

To measure temperature, allow the thermometer aim at the measured target, push the trigger to display the real time measured result; and loose the trigger to hold it. MAX/MIN is off when the middle button is pressed. Thermometer will automatically shut down if no action were detected out within 8s. The ratio of distance to light spot size and the field of view must be allowed for. Laser shall be only used to aim at target object.

SETTING OPERATION:

SET:

Cyclical switching setting status: Click on SET to enter the cyclical switching setting status, which is designed with a circular order as follows: emissivity setting → ℃/℉ setting → temperature limit value mute setting → high temperature limit value setting → low temperature limit value setting. Under different setting status, the corresponding icon will flash, and with a 2s long press on SET, quit the setting status.

After operation, "MAX/MIN" will be "▼", and "☼/▲" will be "▲". When failure to perform the user setting, they would be displayed as "MAX/MIN" and "☼/▲".

Emissivity setting:

It is used to change the emissivity value. E= will flash during setting, click on "▲" with a progressive increase of 0.01 and rapid increase with a long press until up to 1.00; while click on "▼" with a progressive decrease of 0.01 and rapid decrease with a long press until down to 0.1.

℃/℉ setting:

It is used to display ℃ or ℉. The set unit ℃ or ℉ will flash; click "▲" or "▼" to select ℃ or ℉ in cycle.
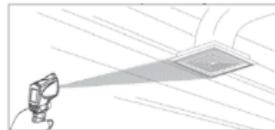
Temperature limit value mute setting:

It is used to set the sound on/off for measured temperature exceeding high or low temperature limit value. When setting, the "🔇" will flash. It is able to select mute on/off in cycle by clicking on "▼" or "▲". When the mute setting is on, it will be displayed as "HIGH LOW", and the buzzer will be mute in case measured temperature exceeds the high or low temperature limit value; while mute setting is off, it will be displayed as ▶HIGH LOW◀ and buzzer will make sounds intermittently in case measured temperature exceeds the high or low temperature limit value.

HIGH limit value setting:

It is used to set the high limit value and the buzzer will make intermittent sounds when measures temperature is higher than the set value. Press "SET" to switch to the flashing "HIGH". When clicking on "▲", the value will increase by 0.1 in progression and it will increase rapidly after a long press, and then a sound will be heard when up to the highest value; When clicking on "▼", the value will decrease by 0.1 in progression and it will increase rapidly after a long press, and then a sound will be heard when down to the lowest measured temperature value or equivalent to the LOW limit value. When "🔇" is flashing, it is allowed to set /cancel the function, and the function will be effective when "▶HIGH" is displayed.
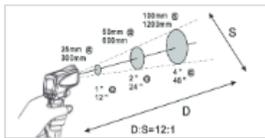
LOW limit value setting:

It is used to set the low limit value and the buzzer will make intermittent sounds when measures temperature is lower

DISTANCE AND SPOT SIZE

With the increasing distance (D) from the measured target, the spot size (S) in the measured region (100℃) will also increase. Spot size represents 90% of the energy in the circle. The maximum D:S will be obtained when the distance between the data recorder and target, and the spot size of 50mm (2in) is generated.

FIELD OF VIEW

D:S=12:1

EMISSIVITY

Emissivity represents the energy emission of material. Most of organic materials and painted or oxidized surface have the emissivity of about 0. 95. If possible, masking tape or Berlin black < 150℃ /302℉) should be applied to cover the measured surface and the high-emissivity device should also be used, as the metal surface with compensated light measurement may cause error reading. Wait a period of time to allow the tape or oil stain share the same temperature with that of surface of the covered object. Measure the temperature of surface covered with tape or paint.

● **MAINTENANCE**

Clean lens
Blow away the slipped off grains with clean compressed air. Wipe the surface carefully with wet cotton swab. Cotton swab should be moistened with clean water.

Clean chassis
Clean the chassis with cotton sponge or soft cloth with soap water or clean water.
To prevent thermometer from damage, do not soak the meter into water.

● **FAULT DIAGNOSIS**

Symptom	Problem	Action
OL (on the display screen)	Target temperature exceeding range	Select the target within range

SPECIFICATION

Function	UT300S
Temperature range	-32℃~400℃/-25.6℉~752℉
Accuracy	±2℃ or 2 % (Ambient temperature: 23℃ ±2℃)
Repeatability	<±0. 5℃ or <±0. 5%
Resolution	0.1℃ / 0.1℉
Distance to Spot Size	12:1
Response time	500mSec
Emissivity	0. 10~1. 00, adjustable
Laser Type	Class 2(II)
Laser Power	<1mW
Laser Wavelength	630nm~670nm
Spectral Response	8um~14um
℃/℉ option	√
Able to shut down laser	√
Display Hold	√
Auto Shutdown	√
Low Battery Indication	√
MAX Mode	√
MIN Mode	√
High Alarm	√
Low Alarm	√

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