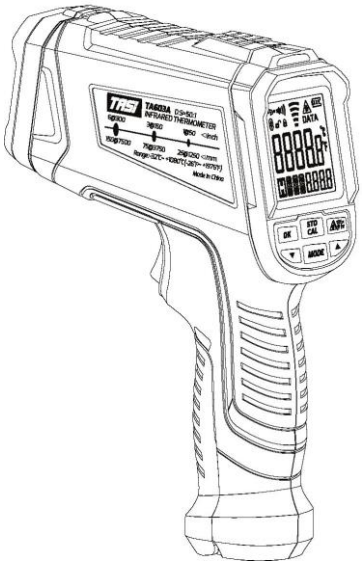
TA603A/ B / C/ D/ E
Infrared Thermometerri E
Instruction manual 1/4.



Pack #:PB01-0117
Thank you very much for your patronage and adoption of our products. Before you use this product, please read this manual carefully. It will teach you the correct operation method and simple inspection and treatment essentials, so as to give full play to the excellent performance of the instrument. Our production and testing are strictly in accordance with the national standard GB/T 36014.1.
Warning: Laser radiation is harmful to human eyes, do not use the laser beam directly aim at the eyes or indirectly at the eyes through a reflective surface.

Note: Please read this manual carefully before using this instrument.

Introduction
This series of hand-held Infrared Thermometer is our company newly developed high-performance and high-quality instrument which uses ARM single-chip computer to collect and process data. The instrument has the functions of emissivity adjustment, maximum value, minimum value, overage value, temperature difference value, high and low temperature alarm setting. It has the advantages of high measurement accuracy, fast response speed, simple operation and reliable use. It can be widely used in petroleum, chemical, railway, electric power, textile, plastic, metal processing, energy-saving and other industries to quickly and non-contact measure the surface temperature of objects.
All objects which temperature is higher than absolute zero are constantly radiating infrared energy. There is a certain functional relationship between the infrared energy radiated by the object and the surface temperature of the object. By measuring the infrared radiation of the object itself, the surface temperature of the object can be accurately determined, which is called infrared temperature measurement. The infrared thermometer

is generally composed of infrared optical system, infrared detector, electronic circuit and other parts.
The infrared optical system gathers the infrared energy radiated by the object within the field of view, imaging on an infrared detector, the infrared detector converts the energy into electrical signal, which is amplified by the electronic circuit and the single chip microcomputer calculates and processes various data and displays the surface temperature value of the measured target.

Panel Introduction
1. Temperature measurement 12 u 1 2 3
status symbol;
2. Laser light indicator symbol;
3. Electric quantity prompt symbol:
4. Stored data symbol;
5. Symbol of temperature unit;
6. Main display area of temperature;
7. Sub display area:
8 STO/CAL button;
9
9 Laser light / sound on / off button;
10 Up button;
11. Sound prompt symbol;
12. USB symbol:
13. Bluetooth symbol:
14. Symbols for manual measurement and continuous measurement;
15. Data holding symbol;
16. Multi-function display symbol:
17. Confirm button;
18. Downward adjustment button;
19. Mode menu button.

Panel Introduction

Operation instructions:

–After installing the battery, press the measurement switch, after the full screen display for 1 second, you can directly press the measurement switch for testing. In the startup state, long press the mode key for 3 seconds to set the relevant parameters, after setting, press the OK key to remember.
- Temperature measurement: Aim at the surface of the object to be measured, pull the measurement switch to display the temperature value. When the measurement switch is released, the temperature value will be held and the buzzer will sound. It can also be automatically measured. There is a "d," sign under the LCD. Press the OK key once, the sign will become
and enter the automatic measurement state:
press the OK key or the measurement key again to exit the automatic measurement state.

Function conversion:

–Press the "MODE" key once to realize the conversion from °C "°F;
- Long press the "MODE" key for 3 seconds to enter the mode setting interface, and the following three "meters" characters 8 will cyclic flashing display "EMS HI,LOW'MAX->MIN->DIF->AVG-,STO->VOL", and select the current mode to set relevant parameters:
- EMS: Press this mode to flash, press the"A" key or "•" key to adjust the emissivity of 0.10-1.00, 0.01 step length, set and press "OK" key to confirm. The default is 1.00:
–Hi (High temperature alarm point setting): when HI is selected to flash, press the "A" key or °X key to set the temperature of high temperature alarm point. Increase or decrease by 1°C (1 °F) for each press, press the "OK" key to confirm, and the default temperature is 1000°C
–Low (Low temperature alarm point setting): when LOW flashing is selected, press the °A° key or"v" key to set the low temperature alarm point temperature. Press the "OK" key to confirm, and the default is - 10°C;
-3-
- Max: When the MAX mode is selected to flash,press the "OK" key to confirm. When testing the temperature, the next small row of numbers will display the maximum value of the tested data.
–MIN: When the MIN mode is selected to flash, press the "OK" button to confirm. When testing the temperature, the next small row of numbers will display the minimum value of the tested data;
–DIF: When the DIF mode is selected to flash, press the "OK" key to confirm. Based on the measured value at this time, the difference between the measured value and the reference value will be displayed;
–AVG: When the AVG mode is selected to flash, press the "OK" button to confirm, when testing, the measured values will be displayed after averaging;
- STO: When the STO mode is selected to flash, press the "OK" key to confirm, and "001 -"will be displayed. At this time, press the measurement key to measure the data and hold a value. Press the "STO" key to store the data in a group of memory, and immediately turn to 2, which can store 255 data at most;
–VOL: Sound size adjustment: the default is 3 units, 0.1.2.3 gear.
Over temperature alarm:
- Hi When the measured temperature is higher than the high temperature alarm point, the red light will be on and the buzzer will sound the alarm sound at the same time:
–Low: When the measured temperature is lower than the low temperature alarm point, the red light will be on and the buzzer will sound the alarm at the same time;
–Each time you press the "LASER" key, it will switch according to the following state: default laser light on -'laser light off -> laser light on-cycle. At the same time, the laser on the LCD will be displayed or disappeared of the same time, and the loser lamp will be turned on by default when the machine is turned on.
Long press the laser lamp key more than 2s to turn off the built-in alarm, and cancel the display of the horn symbol on the screen at the same time, and press and hold the laser light button for more than 2s to build in alarm:
- Laser state: When the laser lamp is on, the loser will be on only when testing, and the loser light will be off after releasing the test key;

−Query the stored data: in the power on state, press the "STORE" key once, it will enter the mode of querying the stored data, and press the "A° or " y" key to query the stored data (the stored data cannot be opened to view without storage);
−Clear the stored data: In the power on state, long press the STORE" key for 3 seconds to clear the stored data; - Low power indication: When the battery voltage drops to 7.0v, the power level symbol will be displayed"=" ;
−If the key is not operated, it will shut down automatically after 30 seconds;
−If the storage key is pressed for more than 3 seconds, the stored data will be cleared;
−Description of object distance ratio As shown in the figure below: S is the diameter of the measured object, D is the measured distance.

Technical specifications

Temperature measurement range	TAGO3A:-32-1080 °C (-261976°0 TA603E-32-1380 °C (-26-2516°F) TA603C:-32-1680 °C (-26-3056°0 TA603D:-32-1880°C (-26-3416°0 TA603E:-32-2200°C (-26-3992 °F)
Temperature measurement accuracy	-32-100°C(±2°C); -26-212°F(±4 F) 100-800°C(±2%); 212F-1472F(±2%) above 800°C(±3%); above 1472°F(±3%)
Repeatability accuracy	+I%or÷1 C(2°F)
Display resolution	-32-1000°C(0.1°C)/1000 above 1°C
Response time and wavelength	Less than 500ms 8--14um
Emissivity	0.1-1.00 adjustable (step length 0.01)
Measuring object distance ratio	50:1(TA603A/B/C) / 80:1(TA603D/E)
Laser aiming	Less than 1MW 650nm laser grade II
C/ Fconversion	V
Screen display mode	VA Color screen
Backlight display	.4
Over range prompt	"HI" or 10°
Power Supply	9V 6F22
Working environment temperature	0°C-50°C
Working environment humidity	70-85%RH Non condensing
Storarature e tempeg	-20°C -60°C not including battery
Product size	213x140x6Omm
Net weight	about180g

Emissivity table

Appendix 1 Method for determining emissivity
−The emissivity of common materials is listed in Appendix 2 for users' reference;
−The emissivity of materials was measured by direct measurement The real temperature of the material is measured by contact thermometer, and then measured by Infrared Thermometer, adjust the emissivity value of the instrument until the measured temperature is equal to the real value, the emissivity at this time is the emissivity of the material.
−The Material which is impossible to measure directly, with low emissivity should be pasted on the surface of the material with black tape or sprayed with black paint (the emissivity of black tape and black paint is EMS = 1.00). After the temperature of the

material reaches balance, use infrared thermometer (the preset emissivity is 1.00, 0.1-1.00, adjustable) measure the temperature of the cover on the material and adjust the emissivity value of the instrument until the measured temperature is equal to the real temperature, and the emissivity is the emissivity of the material.
For the determination of emissivity value, please refer to Appendix I and 2. Appendix 2 emissivity table (for reference only)

Appendix 1

Material	Emissivity		Material	Emissivity	
Aluminum	Non oxidation	0.02-0.10	Asbestos		0.95
	Oxidation	0.02-0.10	Asphalt		0.95
Alumina	Oxidation	0.30			
	Alumina	0.10-0.30	Basalt		0.70
	Rough	0.02-0.10	Brick	Red	0.93
Brass	Polished	0.01-0.05	Emery Ceramics		0.90
	Polished	0.30			0.95
	Oxidized	0.50	Clay		0.95
Chromium		0.02			
Copper	Polished	0.03	Concrete		0.95
	Polished	0.05-0.10	Cloth		0.95
	Oxidation	0.40-0.80	Glass		0.85
Gold		0.01-0.10	Gravel		0.95
Nickel chromium iron alloy	Oxidation	0.70-0.95	Gypsum		0.85-0.95
	Frosted	0.30-0.60			
	Electropolishing	035	Ice		0.95
Iron	Oxidation	0.50-0.90	Paint	Colorless transparent	0.92
	Non oxidation	0.05-0.20		Dark black	0.97
	Rusty	0.50-0.70	Rubber		0.95
Cast iron	Oxidation	0.60-0.95	Lime		0.98
	Non oxidizing	0.20			
	Melting	0.20-0.30	The paint has no alkalinity		0.90-0.95
Forged iron	Matte	0.90			
Lead	Polished	0.05-0.10	Any color of paper		0.95
	Rough	0.40	Opaque paper		0.95
	Oxidation	0.20-0.60	Snow		0.90
Magnesium		0.02-0.10	Soil	Dry	0.92
Mercury		0.05-0.15			
Molybdenum	Oxidation xidation	0.20-0.60	Mud		0.95
	Non oxidizing	0.10	Water		0.93
Nickel copper gold		0.10-0.14	Sand (coarse ore)		0.90
			Nature wood		0.90-0.95

	Oxidation	0.20-0.50
Nickel	Electrolyte	0.05-0.15
Platinum black		0.90
Silver		0.02
Tin	Non oxidation	0.05
Tungsten	Polished	0.03-0.10
Steel	Cold rolled steel	0.70-0.90
	Wool board	0.40-0.60
	Cast steel plate	0.10
	Oxidation	0.70-0.90
	Stainless steel	0.10-0.80
Titanium	Polished	0.05-0.20
	Oxidation	0.05-0.20
Zinc	Oxidation	0.10
	Polished	0.02

Precautions

–The relationship between temperature measurement and target size and distance The relationship between the distance between the infrared thermometer and the target size is expressed by the object distance ratio. The definition of the object distance ratio is the ratio of the distance D from the measured target to the infrared thermometer and the effective area s of the measured target (D: 5), which is the optical index of the infrared thermometer. Through the object distance ratio, the measurement distance can be determined according to the size of the measured target. The object distance ratio is 50:1. In order to reduce the error in actual measurement, the target size should be full of the field of view measured by the instrument, and it is better to make the target size more than twice of the field of view spot.

–The influence of emissivity on temperature measurement Emissivity represents the thermal radiation ability of the object surface. Due to the different material and surface state of the object, its ability to radiate infrared energy is different. In order to compensate the measurement error caused by different emissivity, the instrument should be adjusted according to the material of the object. The emissivity value of the instrument should be adjusted according to the material of the object (In the appendix, the emissivity values of some materials and the determination methods of emissivity are attached for reference). Laser radiation is harmful to human eyes. When using, do not point the laser beam at people's eyes. The technical specifications of the laser used in the infrared thermometer are as follows:

Outlet power: < 1MW

Wavelength: 650nm

Laser grade: Grade II

Operating distance: about 30m

–The instrument should avoid contact with overheated objects, objects with strong magnetic and strong current, corrosive objects such as lipids, ketones, ethylene and dichloride.

Instrument maintenance

–Lens cleaning:

After the infrared thermometer is used for a period of time, dust will be accumulated on the lens. Clean ball can be used to blow off dust on the surface or clean cotton swab is used to clean the lens surface with a little water.

–Shell cleaning:

A soft cloth stained with neutral cleaning solution can be used to wipe the thermometer shell.

–Replace the battery:

When the power indicator on the LCD has no level, please replace the battery in time. In order to protect the environment, please dispose of the replaced batteries properly.

–When the instrument is not used for a long time, please take out the battery and store it.

–If the instrument foils, it should be repaired after being confirmed by the manufacturer or dealer. The user should provide the text description and packing list of the failure phenomenon. The packaging of the instrument should be well buffered and protected.