AT300 / AT600 Series

Precise Body Temperature Measurement Thermal Camera

Quick Start Guide V1.0.3

IRay Technology Co., Ltd.

Version History

Version	Date	Description
V1.0.0	2020-03-06	Initial version
V1.0.1	2020-03-11	Modify the expression in page 9
V1.0.2	2020-03-19	Modify standard packing list
V1.0.3	2020-03-25	Modify the product name

Contents

1. Overview

AT300 / 600 accurate temperature measurement thermal camera can be widely used in medical temperature measurement, body temperature screening, animal husbandry, machine vision, high-precision power detection, high-precision industrial detection and other industries. It can realize real-time temperature information transmission, accurate detection, fast screening and so on. In particular, its abnormal body temperature screening function can be widely used in airports, railways, stations, terminals, schools, and other densely populated places, to achieve rapid screening and avoid congestion.

Figure 1 Product appearance

2. Product Performance

Table 1   Product performance parameter

Model	AT3003F	AT6005F
Performance		
Detector type	VOx Uncooled Infrared FPA Detector	
Resolution	384×288	640×512
Lens Model		
Focal Distance	7.8mm	15mm
Lens control	Support auto focus	
Focus Type	Athermal	Athermal
FOV(Horizon×Vertical)	47°×35.6°	34.2°×27.4°
IFOV	2.1mrad	0.93mrad
Temperature Measurement Function		
Measuring Range	0℃~50℃	
Measurement accuracy@ ambient temperature 16 ℃ ~ 32 ℃ (with blackbody)	±2℃ @Target temperature 0℃~20℃ ±0.6℃ @Target temperature 20℃~33℃ ±0.3℃ @Target temperature 33℃~42℃ ±0.6℃ @Target temperature 42℃~50℃	
Effective temperature measurement distance (meet the measurement accuracy)	1m~5m	1m~5m
Temperature measurement tool	Arbitrary fixed spots Full screen highest / lowest temperature spot capturing Center spot temperature measurement Line / area analysis tools Manual temperature width selection	
Ethernet		
Network Interface	RJ45	

Network Protocol	TCP、UDP、ICMP、IGMP、DHCP、RTSP	
Image Adjustment		
Brightness and contrast adjustment	Manual / Auto 0 (default) / Auto 1	
Polarity	Black hot/White hot	
Palette	18 modes are supportable	
Image flip	Left -right / up-down / diagonal	
Power Supply		
Supply voltage	10-36VDC	
Typical consumption @25℃	≤3W	≤3.3W
Power protection	Support	
POE power supply	Support (based on IEEE 802.3af)	
Physical Property		
Size	55mm×55mm × 119mm （L × W × H)	
Environmental Adaptation		
Operating temperature	-10℃ ~ 60℃ （16~32℃ accurate temperature measurement）	
Storage temperature	-20℃ ~ +65℃	
Shock	30g， 11ms， All axes	
Vibration	4.3g， Random vibration，All axes	
Humidity	5~95%， no condensation	
Software Support		
SDK	Support	
PC software	Support	

3. Installation Guide

3.1 Product and Accessory List

Before installation, please make sure that the equipment in the package is intact and all parts are available.

Standard packaging list			
Camera	adapter bracket	Network cable ×1	Power cable ×1
Blackbody (1 unit)	Power adaptor	Tripod ×2	Extension shaft ×1

Optional package (Prepared by users):

- **Computer performance:** Configuration requires i5 and above CPU, 8G and above memory, 64-bit win10 system, supports Gigabit network;
- **Display**: >1920 ×1080 resolution;
- **Power adapter**: 10 ～ 36VDC, 12VDC is recommended;
- **Tools**: screwdriver, etc.

3.2 Mounting and Connecting Thermal Imager

As shown in the figure below, 4 ×M2 mounting holes are reserved at the bottom of the product for fixing the camera to the adapter or bracket.
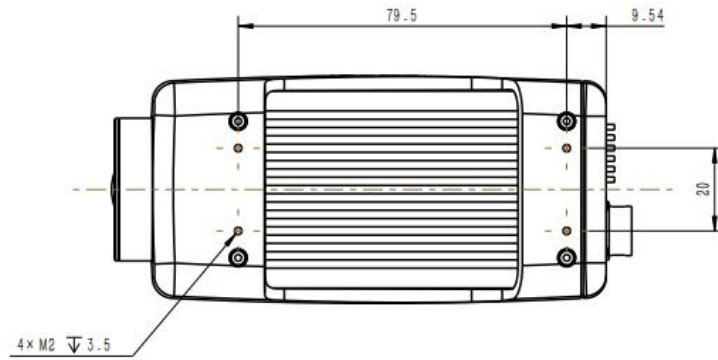
Figure 2   Bottom structure of camera

Take the thermal imager mounted on a tripod as an example, as follows:

● Fix the adapter bracket on the thermal imager with 4 screws(M2*6), as shown in Figure 3;
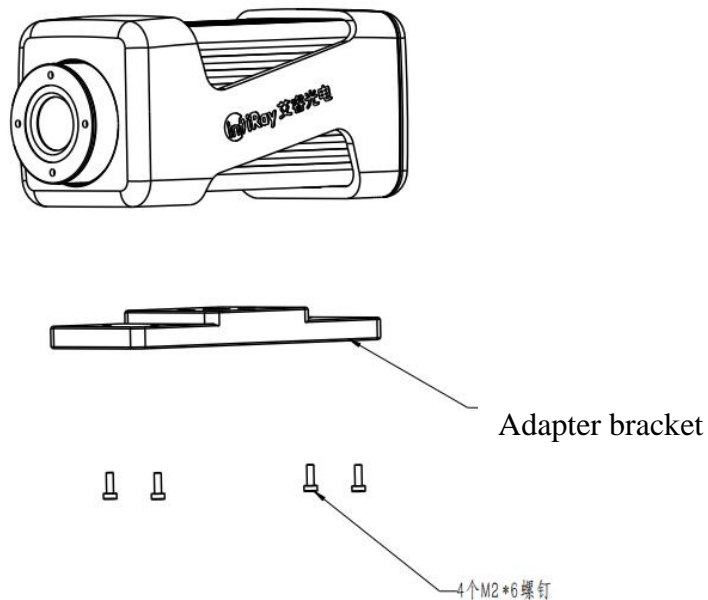
Adapter bracket

Figure 3   Installation of camera adapter

● After the adapter bracket is installed, the bottom of the thermal imager is shown in Figure 4, and it is mounted on the corresponding supporting equipment through the mounting holes 3 / 8-16UNC or 1 / 4-20UNC at the bottom of the adapter bracket.
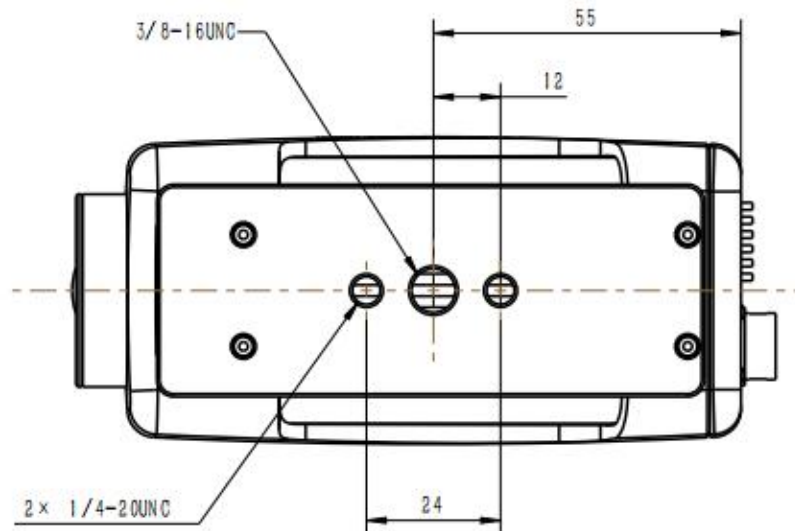
Figure 4   The bottom structure of camera adapter

Take the thermal imager mounting on a tripod as an example, the specific steps are as follows：

Step 1: Remove the fixed adapter on the tripod;

Step 2: Screw the screws on the adapter into the 3 / 8-16UNC mounting holes on camera adapter ;

Step 3: Attach the fixed base to the tripod with the camera.

| Step 1 | Step 2 | Step 3 |

Figure 5 Thermal camera mounting steps

2） Plug the power cable and network cable into the ports of the camera and the RJ45 interface of the network, the other end of the network cable is connected to the computer network port, and the other end of the power cable is connected to a DC power adaptor (12V is recommended).

Power supply

Gigabit Port
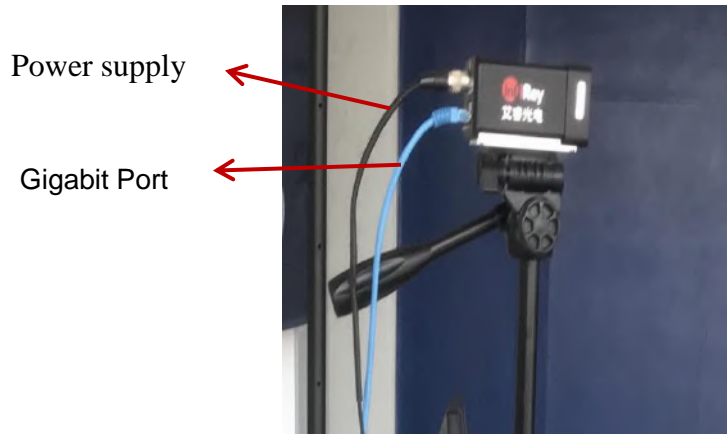
Figure 6 Interface of camera

3) Power up the power adaptor and power up the camera. The sound of the shutter action is heard immediately after power-on, indicating that the camera has been powered on successfully.

4） After the power on 1 minute, run the web client or PC client , connect the device;

5） In order to ensure the accuracy of temperature measurement, the thermal imager needs to be stable for 40 minutes after powering on, and then start the temperature monitoring

Notes:

Following picture shows the demension of connector which is used to provide power.

It provides a reference to buy a matched DC power adaptor .
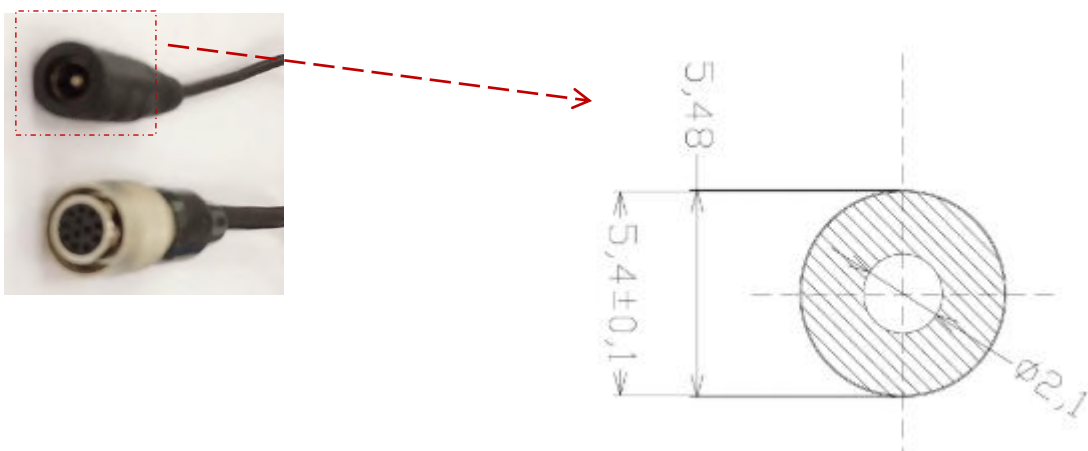
3.3 Introduction of Reference Blackbody

3.3.1 Specification

The specification of reference blackbody is shown in table 2.

Table 2 Reference blackbody parameters

Reference blackbody	
Power supply	AC180~240V
Max. power consumption	260W
Environment temperature	0℃~40℃
Accuracy	±0.2℃@35℃
Emissivity	0.97±0.02
Settling time	≤5min
Temperature stability	±（0.1℃~0.3℃）/h
Effective radiant surface	100mm×80mm
Dimension（L×W×H）	195mm×150mm×110mm

3.3.2 Structure of Reference Blackbody

As shown in figure 7, you can find the drawing of reference blackbody. The top and bottom of the blackbody are reserved with the American standard 1/4-20UNC tripod interface, which is convenient to install for users. Four foot-pads are distributed at the bottom of the four corners, can be used for horizontal placement.

Effective heating area

1/4-20UNC
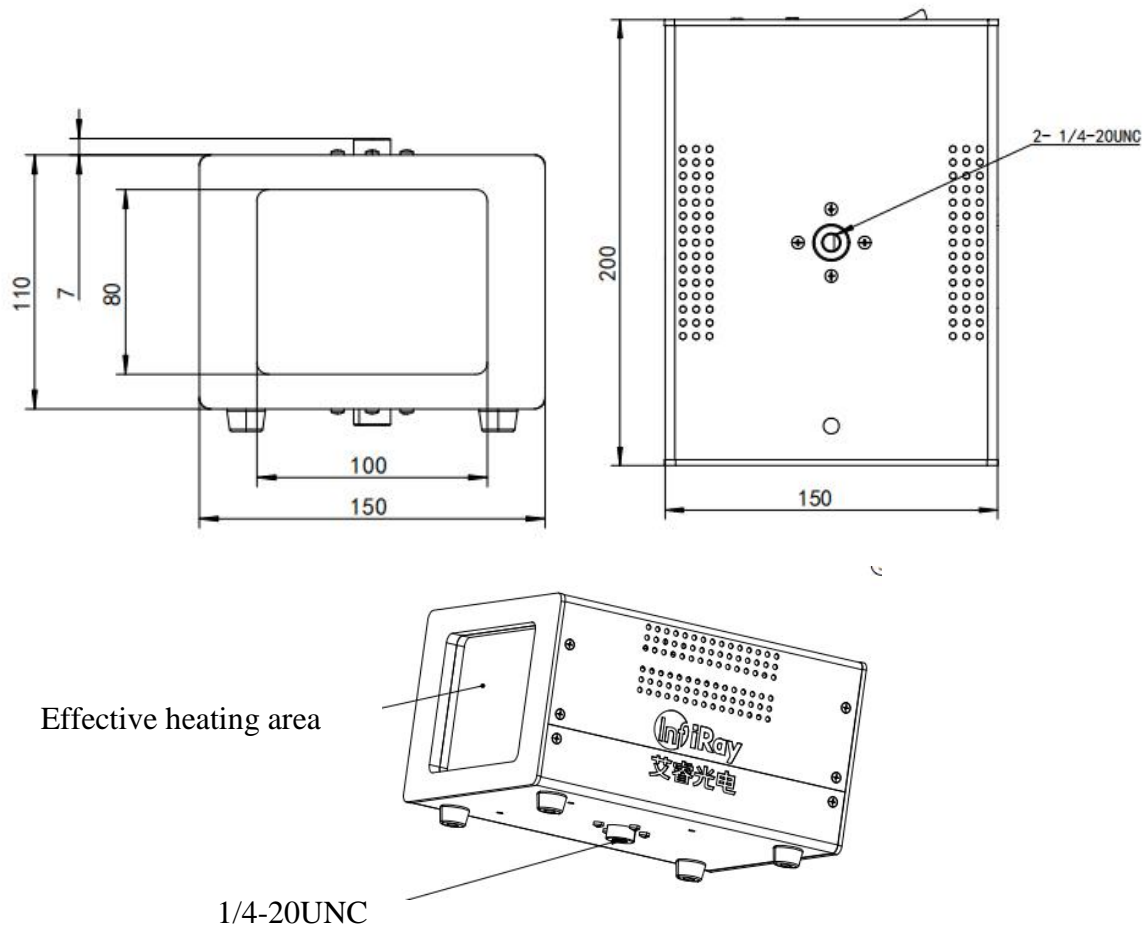
Figure 7 Drawing of blackbody

3.3.3 Quick Start and Attentions

Connect power supply(AC180~240V), and turn on the power switcher on the blackbody, the power indicator is on, it display 35℃ in default. The blackbody can be used normally when it gets stable after waiting 5 minutes.

Attention：

● Please ensure the correct input of power supply;

● Please do not to touch the heating area of blackbody, in case of scalding;

● The blackbody should be used under the environment temperature of 25℃, to ensure the accuracy of equipment;

- Avoid using in the humid environment and beyond the operating temperature range, so as not to affect the accuracy of the equipment.

3.4 Site Layout Solution

1）、Reference layout

Refer to Figure 8 for the layout plan in a wide space area. The external reference blackbody is placed directly in front of the infrared camera and made it observable in the imaging field of view . Pedestrians need to be guided and make sure all of them can be observed with the thermal imaging camera.
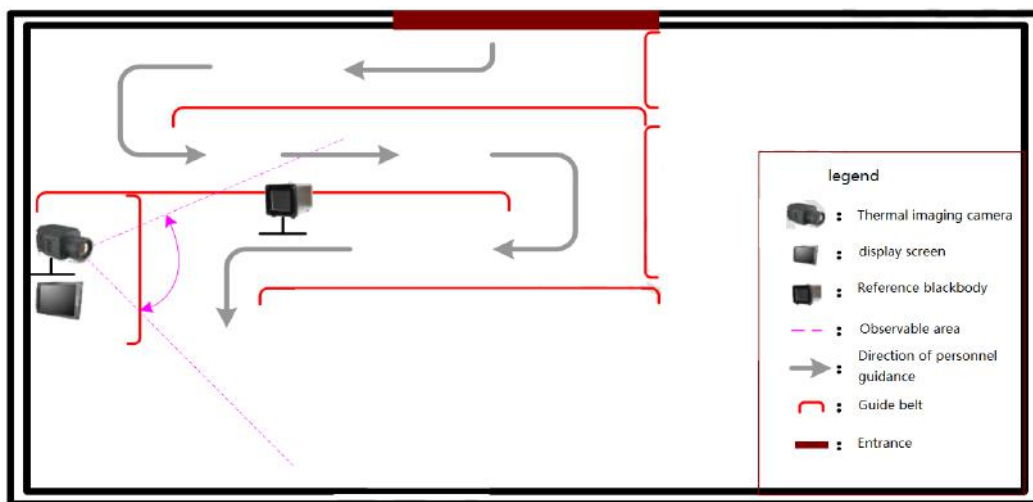
Figure 8   Arrangement of infrared human body thermal imaging camera

- Installation direction and height of camera

The installation distance and height of the camera should be arranged according to the actual situation, the recommended distance is **2m**, and the installation height should ensure that all of the observed pedestrians can appear in the field of view.

- Reference black body layout

As shown in Figure 9, adjust the direction and position of the infrared human body thermal imaging camera and the reference black body so that the reference black body appears in the 2/3 central area of the camera market and shall not be shielded by pedestrians.
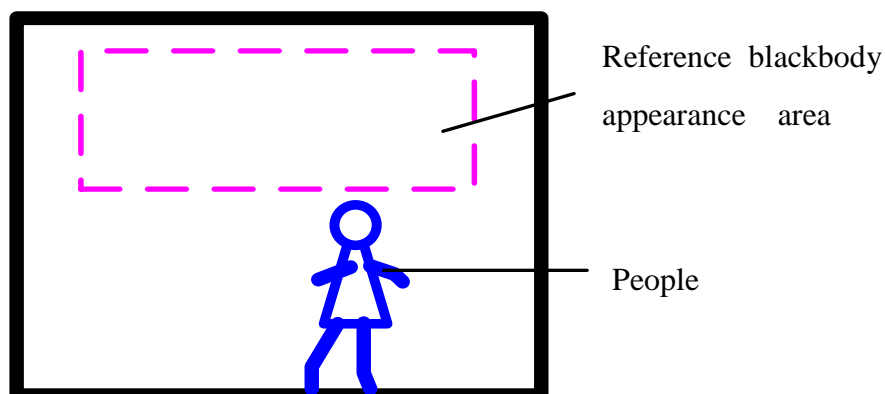
Figure 9 Infrared imaging on PC

● Environmental requirements

The infrared temperature measuring camera is arranged in an environment where the temperature is relatively constant and there is no direct sunlight, to avoid temperature measurement errors caused by the temperature changing environment affecting the human skin surface temperature. According to the above installation requirements, the following installation methods can be used to install equipment in halls and aisles.

3.4 Site Installation and Layout Considerations

1）、Avoid placing it at the entrance with airflow disturbance

Avoid the temperature rise and fall caused by the air surface disturbance of the skin of the person being tested, which will affect the false alarm or miss alarm of the infrared temperature measuring camera.

2）、Select the right monitoring scenario

Avoid using infrared cameras in environments with large areas of high temperature objects (such as electronic billboards, large area light boxes, glass walls that are exposed to the sun, etc.). These hot objects may cause false alarms or missed alarms.

3）、The ground of the monitoring site should not be too smooth

Avoid the temperature rise and fall caused by the airflow disturbance on the skin surface of the person being tested, which will affect the false alarm or leakage of the infrared thermometers.

4）、Reserve a long enough channel

Prevent the person being tested from entering the room and testing directly in a hot / cold outdoor environment. Since the skin temperature is higher or lower than real skin temperature when they first enter a room with a constant temperature from a hot / cold outdoor environment, at this time, a long enough channel needs to be reserved to allow the subject's body surface temperature to gradually stabilize before testing. To avoid false alarms or missed alarms of the infrared camera.

4 Quick Start of PC Client

Professional temperature screening client will be provided , users can easily get the thermal image and body temperature. If you need "InfiRay Intelligent Infrared Temperature Screening System Operation Manual", please contact us.

Product model	tool	Instructions for using
AT3003F/AT6005F	IRay Intelligent Temperature Screening System	"InfiRay Intelligent Infrared Temperature Screening System Operation Manual"

please refer to the following method to set environmental parameters on PC client .

- **Atmospheric temperature**: Set according to the ambient temperature of the site.

- **Reflected temperature**: If there is no high temperature object in the use environment, set it to the ambient temperature.

- **Emissivity:** If measuring body temperature, it is recommended to set as 0.98.

- **Atmospheric transmittance**: Use indoors or in places with good visibility. Keep the default parameter 1.

- **Distance:** set according to the use conditions, the default is 2m.

- **Temperature measurement mode:** Standard mode and correction mode are available for selection. The temperature measured in the standard mode is the real temperature. The temperature measured in the correction mode is the internal temperature of the human body calculated from the human skin temperature. Especially, correction1 should be selected when carrying out body temperature screening .

5、 Troubleshooting

Fault description	Possible Causes	Method of exclusion
Image blur	Objective focal length does not match	The thermal imager is aimed at the target position, click the auto focus on the PC client
	Long time without image correction	On the host computer, click the shutter correction
Boot failure	The supply voltage exceeds the normal working supply voltage range	Check if the power supply voltage is between 10 ~ 36V
	Power connector is loose.	Check whether the power interface is connected reliably.
Low measuring accuracy	The thermal camera stabilization time is too short	Keep the camera stable for more than 40 minutes
	Reference blackbody position setting is incorrect	Reset the position of blackbody
	Unfocused	Aim at the target position for auto focus calibration
Boot failure with report "without mfc300.dll library"	No VC environment installed	Install VC environment library
Click preview and show parameter error	Network IP address has not modified to the same IP segment of camera	Manually configure computer address to 192.168.1.XX network segment
Network parameters were recognized, but the connection failed	The network IP address is set incorrectly	Modify the computer's fixed IP address to the correct network segment
Image stuck	1、 Check whether the power and network cable connections are dropped. 2、 The power supply is interrupted	After detecting the power, restart the software to connect
Image video freeze	Inadequate computer configuration	Check if the computer support Gigabit Ethernet

6、Maintenance

6.1 Notice

- Make sure the camera is fixed firmly when the camera is installed on wall, ceiling or pillar.
- The camera shall not fall on the equipment, especially vigorous vibration equipment. Keep the camera away from the presence of magnetic field interference, avoid mounting camera to the surface where occurs vibration or shocks easily.（The camera may be damaged ignoring this item）.
- The camera lens shall not be aimed at the high temperature target such as sun, incandescent lightetc., or it may damage the lens or detector.
- Equipment used indoors should not be installed exposed to rain or very wet areas.
- Do not place the equipment in an environment with corrosive gas, which may cause damage to the equipment.
- Avoid placing equipment in the area where has direct sunlight, poor ventilation , or near heat sources such as heaters (ignoring this can lead to fire hazards).
- Please keep all original packing materials of the equipment properly, so that in case of any problem, use packing materials to pack the equipment and send it to the agent or return it to the manufacturer for treatment. IRay shall not be responsible for any accidental damage in transit caused by materials other than the original packaging.

6.2 Cleaning and Maintenance

- Do not use cleaning products that corrode or scratch optical glass components.
- The germanium window surface is coated with anti-reflection coating, dust, grease, fingerprints will produce harmful substances and lead to its performance decline or cause scratches, once found dirt, please follow the following methods.

1) Use a blown balloon or a soft brush to clean the lens surface and avoid dust particles scratching the anti-reflection film on lens surface during the wiping process.

2) Use soft cotton cloth or lens wiping paper to dip in alcohol or lens wiping liquid, gently wipe the lens surface from the middle to the edge, pay attention to do not squeeze the lens surface,

wipe liquid also can not dip in too much, make sure the cloth is wet, but wipe liquid can not be extruded. If still not clean, replace the cloth and repeat operation.

6.3 Safety Codes

- Please use standard power supply, to avoid the camera is damaged by over-voltage.
- Short-circuit is prohibited.
- Hitting or beating the product with sharpen object is prohibited；
- The product shall not be exposed in the high temperature environment which is higher than 80°C.
- Do not put the product into the fire.

7. After sales service

The AT300／AT600 precision body temperature measuring infrared camera is developed by our company and has good after-sales service guarantee such as equipment maintenance and repair. If you have any needs, please contact our company.

8. Company information

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