塔机视频监控管理系统
Video Monitoring System for Tower Cranes

安装使用说明
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一．产品概述

1.1 产品特点

CXT-110A 型塔机视频监控系统，可将塔机的吊钩下方吊装视频、起升机构、变幅机构、回转机构的运行情况发送到驾驶室，让塔机司机掌控整个塔机的运行状态，减少塔机因为机构故障或因吊装视野不清楚而造成的安全事故。

本系统采用成熟的视频解决方案，系统更稳定，体积更小巧，支持断电保护及 500G 硬盘，记录时间长达 72 小时以上。系统满配有四个 1080P 数字摄像头，三个定焦，一个可变焦摄像头。变焦摄像头有 22 倍~30 倍可选，清晰视野距离达到 300 多米。

备注：用户可根据自身需要选择摄像头的数量来进行订货。

I. Product overview

1.1 Product characteristics

tower crane video monitoring system (CXT-110A) can send the operation conditions of hoisting video, hoisting mechanism, amplitude mechanism and slewing mechanism which under the lifting hook of the tower crane to the driver's cabin. In this way, the tower crane driver can control the operation state of the whole tower crane and reduce the safety accidents caused by the failure of the mechanism or unclear hoisting vision of the tower crane.

This system adopts mature video solution, which makes the system more stable. It has smaller size, supports power-off protection and 500 G hard disk, and the recording time is more than 72 hours. The

system is fully equipped with four 1080 p digital cameras, three fixed focus cameras and one variable focus camera. The zoom camera is 22 to 30 times, and the clear visual field distance reaches more than 300 meters.

Note: Users can choose the number of cameras to order according to their own needs.
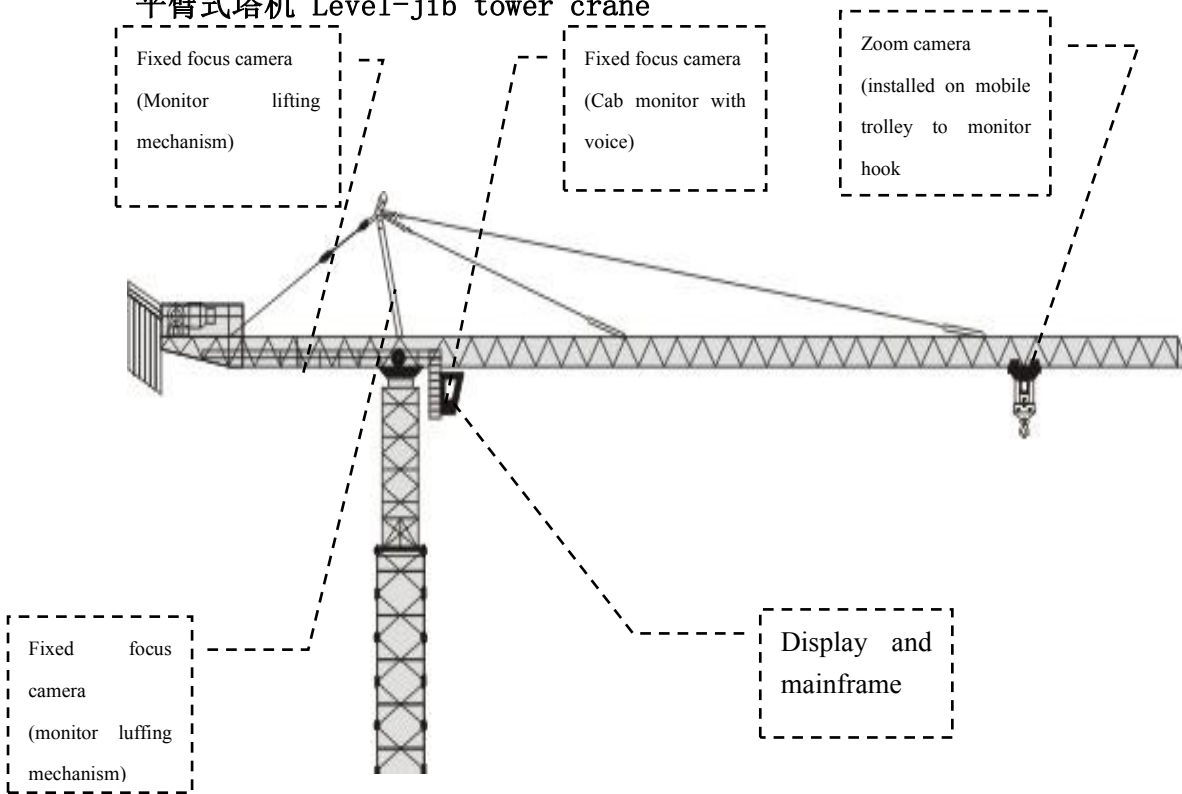
1.2 性能参数 Parameter

1	工作环境温度 Working environment temperature	−20℃～60℃
2	工作环境湿度 Working environment humidity	≤95%(45℃)
3	电源电压 Power supply voltage	～ 220V（可按需定制）(customizable)
4	工作方式 Mode of operation	连续
5	变焦摄像头 Zoom camera	20~30 倍光学变焦，最大分辨率 1080P Zoom camera 20 – 30x optical zoom, maximum resolution 1080P
6	定焦摄像头 Fixed focus camera	最大分辨率1080P Maximum resolution 1080P
7	存储大小 the storage capacity	500G　可按客户定制 500G　customizable
8		

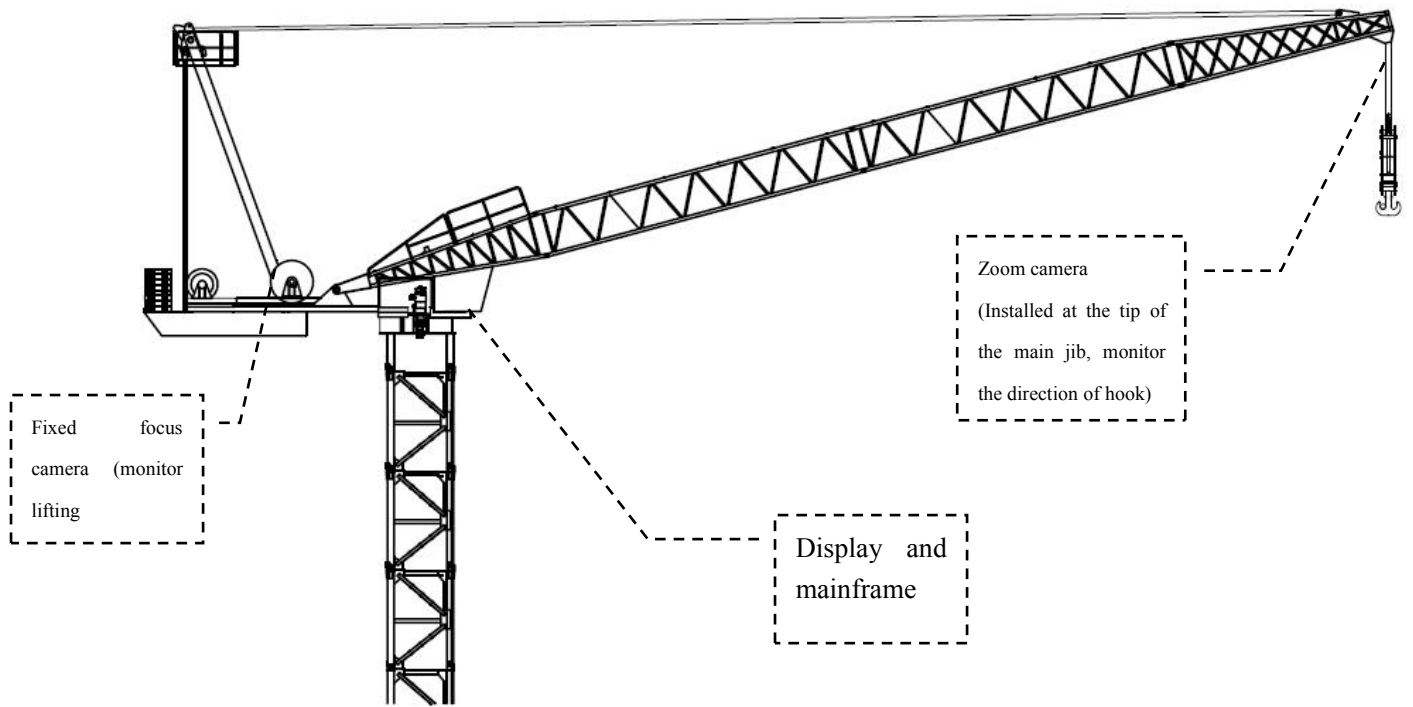|		
9		

二．系统组成 System Composition

　　CXT-110A 型塔机视频监控管理系统的硬件组成下图，包括了显示屏、主机、变焦摄像头、定焦摄像头、变焦控制踏板（平臂式塔机还需要增加太阳能供电系统）

Composition of the system is shown as below, including display,mainframe,fixed focus camera, zoom control pedal (level-jib tower crane needs to add solar power supply syste,)
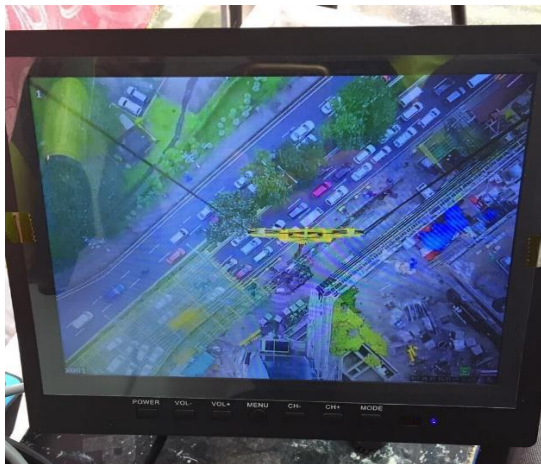
平臂式塔机 Level-jib tower crane

Fixed focus camera (Monitor lifting mechanism)

Fixed focus camera (Cab monitor with voice)

Zoom camera (installed on mobile trolley to monitor hook)

Fixed focus camera (monitor luffing mechanism)

Display and mainframe

动臂式塔机 Luffing tower crane

Zoom camera
(Installed at the tip of the main jib, monitor the direction of hook)

Fixed focus camera (monitor lifting

Display and mainframe

组成部分：Component

1.显示器 Display

2.系统主机 System Mainframe

3.变焦摄像头 Zoom camera

4.定焦摄像头 fixed focus camera

5. 变焦踏板 Zoom pedal

6. 无线传输组件（平臂式塔机使用）

Wireless transmission parts（ level-jib tower crane)

7. 太阳能电池组件（平臂式塔机使用）

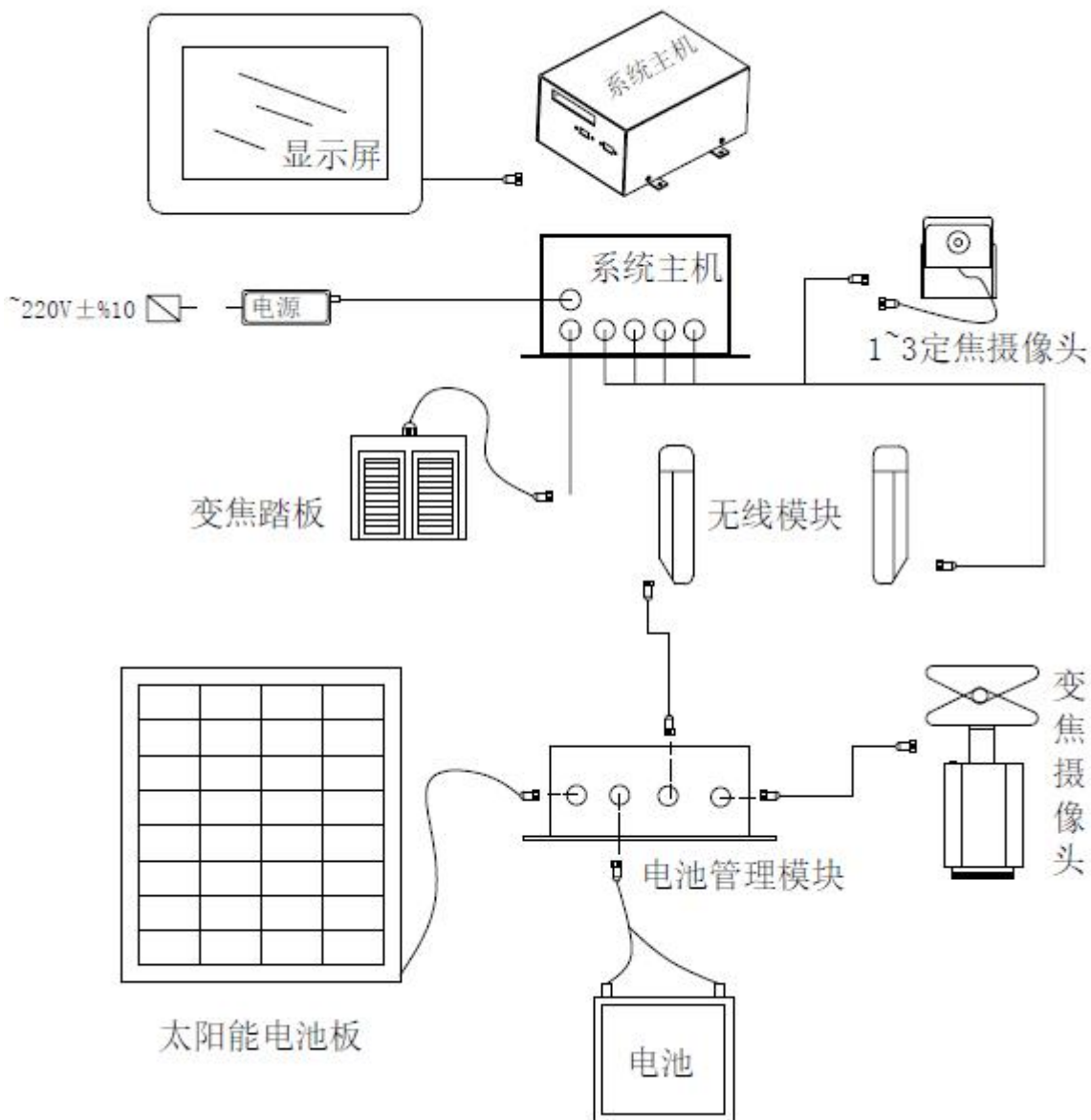Solar battery parts(level-jib tower crane)

8. 电池及控制单元（平臂式塔机使用）

battery and control unit(level-jib tower crane

连接示意图 Connection diagram

无线视频系统组成

无线视频系统组成	Composition of wireless video system
显示屏	Display
系统主机	System mainframe
电源	Power Supply
定焦摄像头	Foxed focus camera
变焦踏板	zoom pedal
无线模块	wireless module
太阳能电池板	solar panel
电池管理模块	Battery management module
变焦摄像头	Zoom camera
电池	Battery

上图：Diagram Above

无线视频系统主要用于平臂式塔机。变焦摄像头安装在变幅小车上，跟随小车前后运动，监视吊钩下方情况。定焦摄像头安装在各个机构附近，监视机构运行情况。

The wireless video system is mainly applicable for level-jib tower crane. The zoom camera need to be installed on the amplitude trolley, and moves back and forth with the trolley to monitor the situation under the hook. The fixed cameras, which are installed near each mechanism, are used to monitor the working states of the mechanisms.

下图：Diagram below

有线视频系统主要用于动臂式塔机。变焦摄像头安装在大臂臂尖位置（增加一个跟随旋转器），当大臂角度变化时摄像头跟随大臂角度变化，始终监视吊钩运行情况。

Wired video system is mainly applicable for luffing tower crane. The zoom camera is installed at the tip pf the main jib(add one follower coverter) When the angle of the main jib changes the camera follow the changes, always keep on monitoring the working states of the hook.
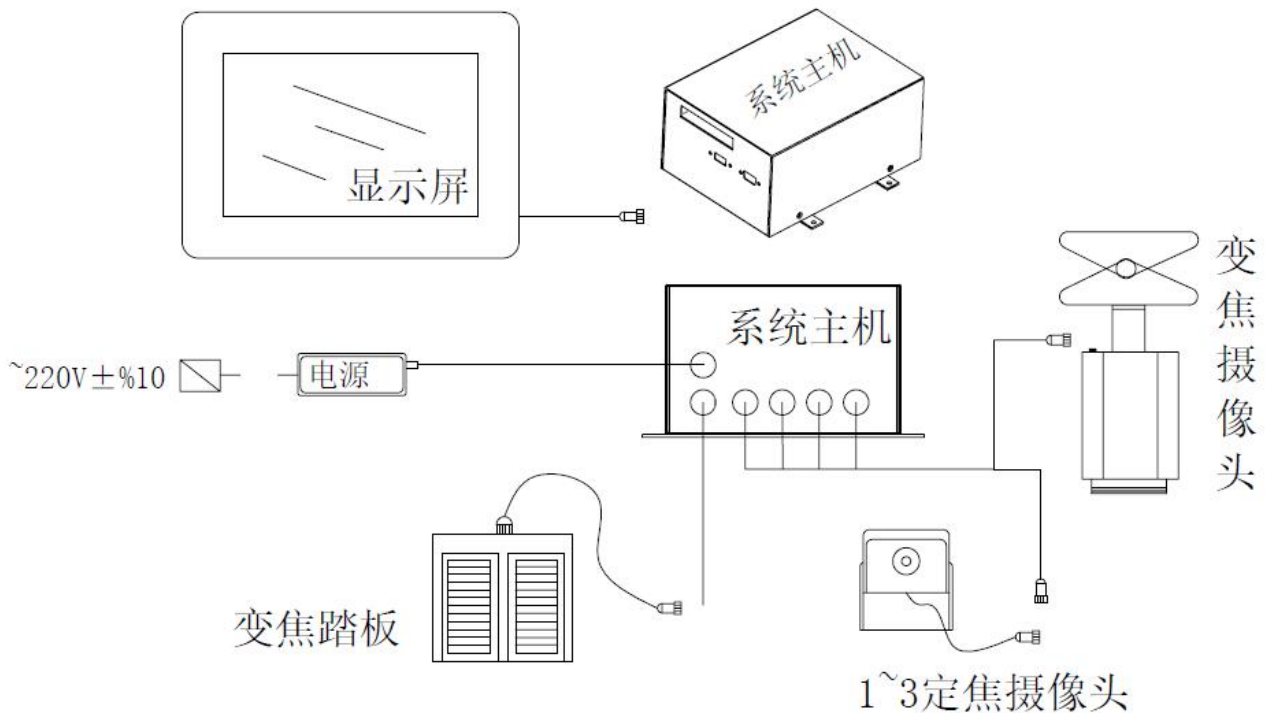
有线视频系统组成	Composition of wired video system
显示屏	Display
系统主机	System mainframe
电源	Power supply
系统主机	System mainframe
变焦摄像头	Zoom camera
变焦踏板	Zoom pedal
定焦摄像头	Fixed focus camera

以上两种视频系统的连接线的插头都是唯一的，防止插错。

The plugs of the connection wires of the above two video systems are unique to prevent plugging errors.

三.硬件安装　Hardware installation

3.1 司机室主机及显示器安装 Installation of cabin's mainframe and display

建议显示器安装在司机室左侧适当位置，（具体安装方式用户自行处理 ）。

It is recommended that the display should be installed on the proper left side of the driver's cabin.(uses install based on actual situations)

3.2 变焦摄像头的安装：installation of zoom camera

左：平臂式安装在小车下，监视吊钩的吊装状态。

Left: The level-jib type is installed under the trolley. It is used to monitor the lifting status of the hook.

右：动臂式安装在臂头位置监视下方吊钩吊装状况。

Right: The luffing type ,which installed at the tip of the jib,is used to monitor the lifting status of the hook
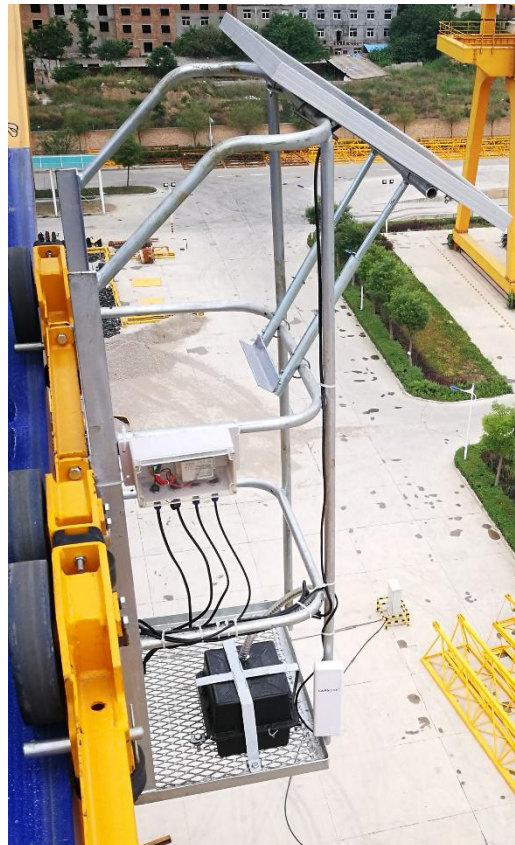

3.3 定焦摄像头安装安装　Installation of the fixed focus camera

安装在平衡臂后方，监视起升卷筒排绳情况

Installed behind the counter jib to monitor the monitor the rope of the lifting drum

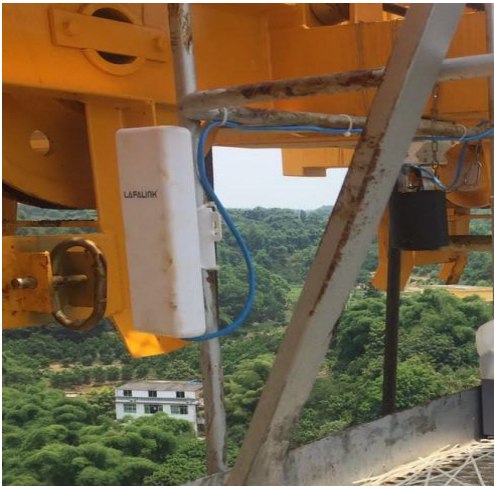**3.4 太阳能供电系统安装　installation of the solar panel system**

安装在小车围栏上方，保证 10°的倾斜，防止雨水或树叶遮挡。

电池安放在围栏内部并固定好。

Installed above the trolley fence to ensure a 10 degree tilt to prevent rain or blocking of the leaves.

3.5 无线通信设备安装　Installation of wireless communication equipment

安装在小车围栏栏干上，对向驾驶室接收端。

It is installed on the rail of the trolley fence, which faces to the receiving end of the driver's cabin.

四．功能介绍　　Function Introduction

一、视频系统主机　　System mainframe

电源　　变焦踏板　　　4X 摄像头接口
Power　　zoom pedal　　4X camera interface
supply

显示器接口　　USB 接口　　移动硬盘
Display interface USB interface　mobile hard disk

www.symcrane.com　　elena@symtowercrane.com　　0086 15542263171

录像机的 4 个 8 芯输入接口可随意连接；变焦脚踏板接口为 5 芯航空插头（踏板上红色为将镜头倍数放大，黑色将倍数缩小），右侧为 4 芯电源航空插头输入。录像机上有一 VGA 接口，此接口与显示屏上 VGA 接口连接。VGA 线内提供显示屏的电源，显示屏无需外加电源。

4 pcs of 8 cored input interface of DVR can be connected freely.The zoom pedal interface is 5 cored aviation plug（red key is used to enlarge lens magnification. Black is used to reduce multiple; The interface on the right side is the 4 cored power supply aviation input. DVR has one VGA interface, which connect with the VGA interface of display. The VGA cable provides power supply for display, so there is no need to add other power supply.

二、显示屏 Display
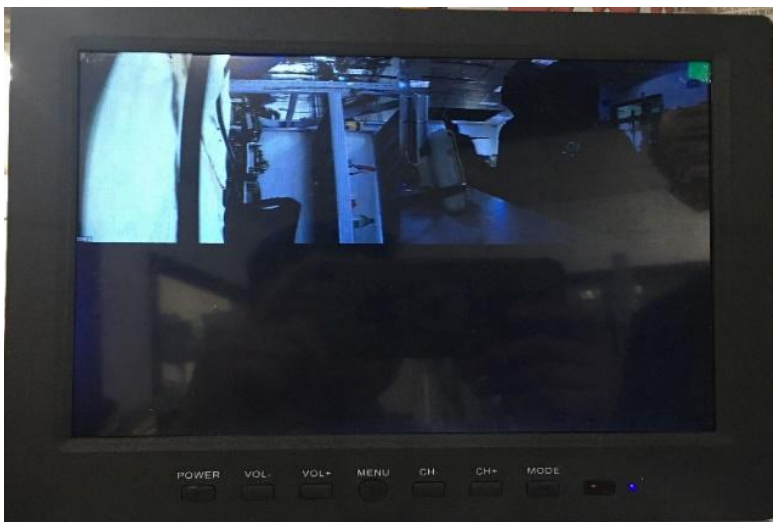
屏幕尺寸：9.7inch   4：3

Screen size

液晶屏像素：1024*768

Lcd pixel

外观尺寸：235*200*29mm

Cover dimension

上图中 MODE 键为 1/2/4 分屏显示功能键；POWER 键为循环切换键：当 1 分屏时按此键可在 1.2.3.4 路摄像头之间循环切换；当前为 2 分屏时按此键可在 1+2/1+3/1+4/2+3/2+4/3+4 之间循环切换。右下角出现[R]标识时标识系统正在

录像，无摄像头连接时不录像。正常情况下摄像头连接后，设备上电等 1-2 分钟会出现图像和录像标识。

The mode key in the photo is 1 / 2 / 4 split display function key; Power key is the cycle switch key: when it shows 1 split screen ,press this key to switch between the 1. 2. 3. 4 camera; when it is 2 split screen, press this key to switch between 1 + 2 / 1 + 3 / 1 + 4 / 2 + 3 / 2 + 4 / 3 + 4. When the [R] mark appears on the lower right corner, the system is recording. If no camera is connected, it will not be recorded. Normally, after the camera is connected and the system is power on,it will show the sign of picture and video recording after 1-2 minutes.

三、变焦踏板 Zoom pedal

变焦踏板只对 1 号窗口进行控制，变焦踏板上红色为将摄像头倍数放大，可以看到更远处的物体；黑色按键为将倍数减小，可以看到的范围更大。变焦摄像头在显示屏的相应通道左下角会有当前的倍数显示。

The zoom pedal only controls window 1.When press red key,the rate of camera will enlarge,you can see objects from far distance.When press black key,the rate will reduce,and you can see larger range.The zoom camera will have current multiple displayed on the lower left corner of display.

三、录像视频提取 video extraction

SATA 转 USB 硬盘转接线 Sata to USB hard drive adapter

A.硬盘抽取出后通过 SATA 转 USB 线可直接被电脑识别，可执行文件读取、播放等操作。

B、录制视频文件在 VIDEO 文件夹内，格式为 MPEG，电脑可直接用播放软

件播放，文件以录制顺序命名。

A.After extraction,the hard disk can be directly recognized by the computer through SATA to USB line , it can read file ,play and do other operations.

B.The recorded video has been kept in VIDEO file folder in the format of MPEG. The computer can play directly with the DVD player software. The file is named based on the recording time.

四、变焦摄像机 Zoom camera

影像传感器： AR0130,

扫描方式：逐行扫描

最大分辨率：1280*960

信噪比：>50dB

焦距：4.7---84.6mm

变焦倍率：22 倍（可定制更大倍数）

变倍速度：2 秒

水平视角：55.2°---3.2°（广角—远焦）

最小物距：10mm(W)-1500mm(T)

光圈：自动

标准电压： DC12V±10%

防水系数：IP68   可配置阻尼器装置

工作温度：-20℃ to +60℃

Image Sensor: AR0130
scan mode: line by line

Maximum resolution: 1280*960

SNR:>50dB
focal length 4.7---84.6mm
zoom:22 times   (can be customized to larger times)

variable speed:2 seconds
Horizontal perspective:55.2°---3.2°(wide angle-far focus)
Minimum object distance:10mm(W)-1500mm(T)
Aperture:automatic
Standard voltage:DC12V±10%
Waterproof coefficient:ip68   can be equipped with damper device
Working temperature:－20℃ to ＋60℃

五、定焦摄像机　　**Fixed focus camera**

1　主要功能：

A　红外夜视，10 米距离清晰

B　防水等级：IP68,

主要技术参数：

A　最大功率小于 2.5W

B　工作电压：12V±10%

C　工作温度：-30℃ TO +60℃

1.全天候录像监控，自动循环录像功能。

2.全方位监控功能：通过塔机上摄像头，全方位记录塔机工作情况。

3.夜视功能：通过红外摄像头，可记录夜间卷筒运行。

4.USB 移动硬盘功能，方便视频导出。

5.密码保护功能。

1 main functions:

A infrared night vision, 10 meters clear

B waterproof grade: ip68,

Main technical parameters:

A maximum power is less than 2.5w.

B working voltage: 12v 10 %

C operating temperature: - 30 ℃ to + 60 ℃

1. 24-hour video surveillance and automatic circulating video recording.

2. Comprehensive monitoring functions: record the tower crane's work situation all-round through the camera on it.

3. The night vision function: record drum's running at night through the infrared camera.

4. USB mobile hard disk function, it is convenient to import and export.

5. Password protection function.

五．系统维护 System maintenance

系统主机及显示器：（本系统通电后自动运行，免系统维护）

System's mainframe and display(the system will run automatically after being powered on, free of system maintenance)

● 经常检查显示器固定支架，保证牢固、可靠、不松动。

Often check the fixation and connection between mainframe and monitor. Keep them firm, stable and free of loose status.

● 定期检查供电电缆，外皮无破损；接电端子处牢固、可靠；接地良好。

Regularly check whether the power supply cable is broken or the sheath is damaged. Check if the connection is firm and stable on the grounding.

● 控制盒引出电缆、插头、插座等无松脱；线缆不得随意插拔，以免接触不良。

Check if the lead-out cable, plugs and sockets are loose. Do not insert or draw the cable improperly, or it may cause poor contact.

● 面板不得用化学溶剂清洗，可用半湿毛巾擦拭。

Do not clean the panel with chemical solvent. Wipe it with semi-wet towel.
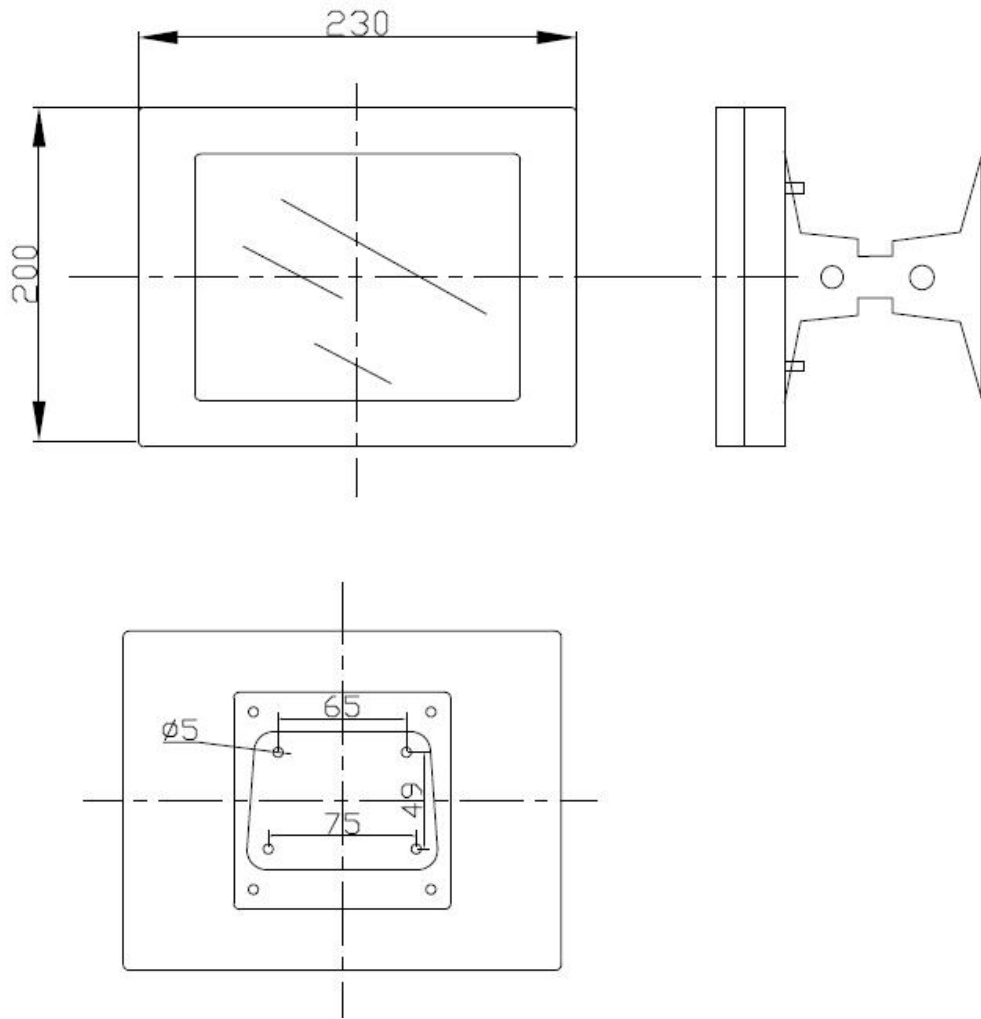
● 注意防雨，避免阳光直接照射。

Keep the main board from rain and avoid exposing to sunlight directly.
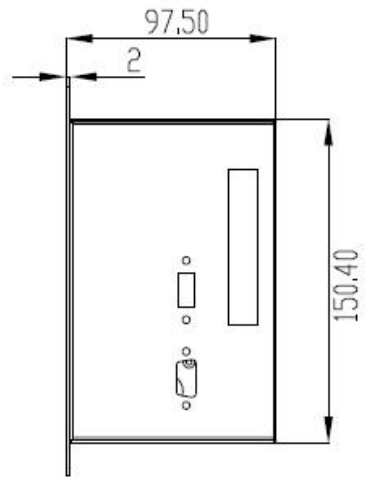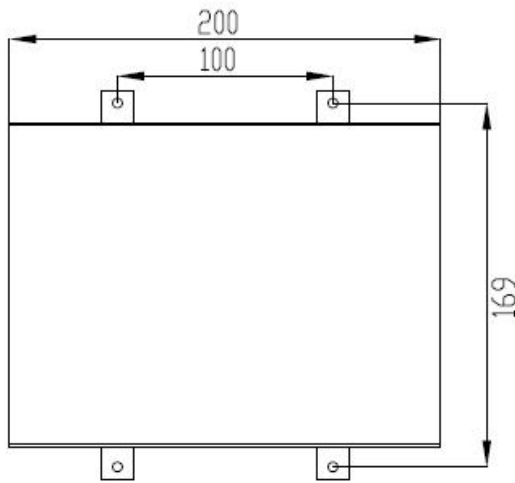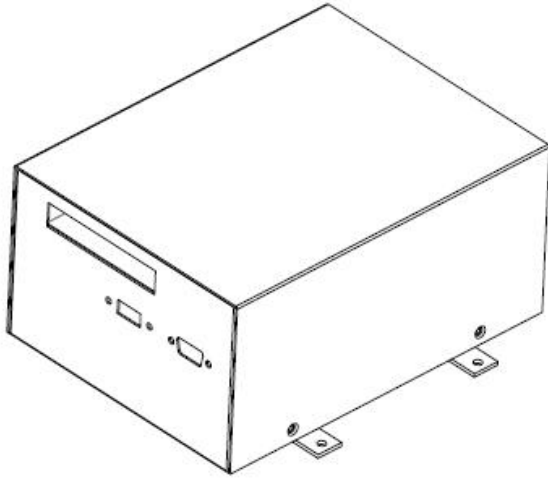
● 控制盒盖不得自行开启。

Do not open the rear cover of case randomly.

七．主要安装尺寸 **Main installation dimensions**

1.显示器　Display

2.视频系统主机　　Video system mainframe

200
100
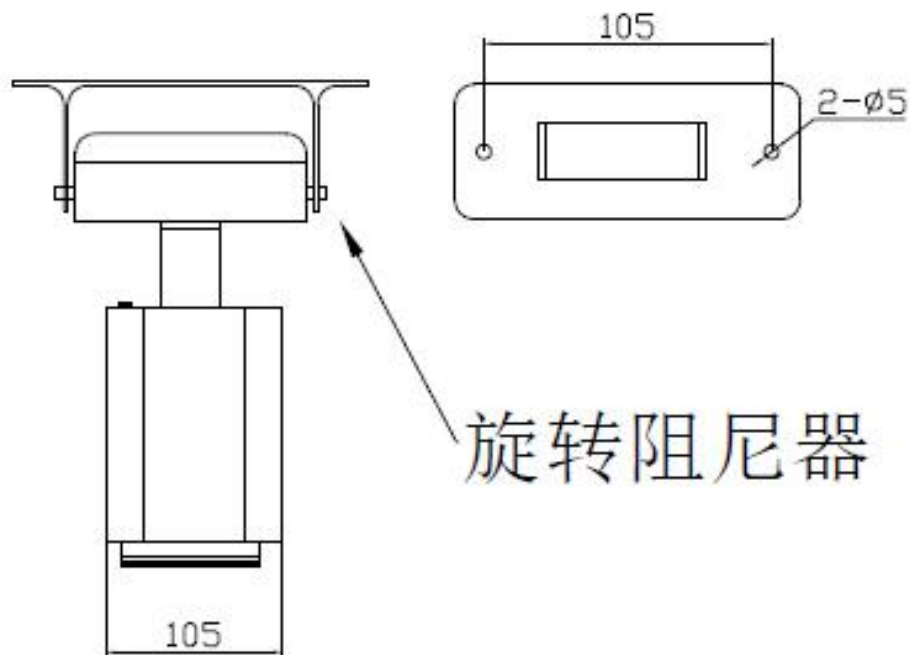169
97.50
2
150.40

3.定焦摄像头　　fixed focus camera

57
43
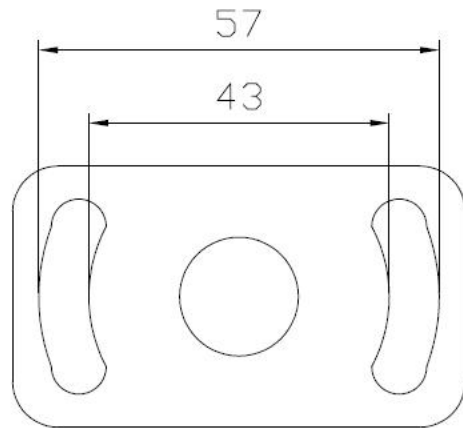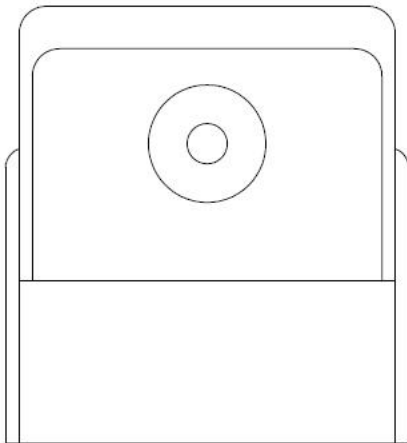
4.变焦摄像头　　　Zoom camera

动臂式使用

105

2-⌀5

旋转阻尼器

105

平臂式使用

6-⌀5

105

60

90

240

万向连接器

105
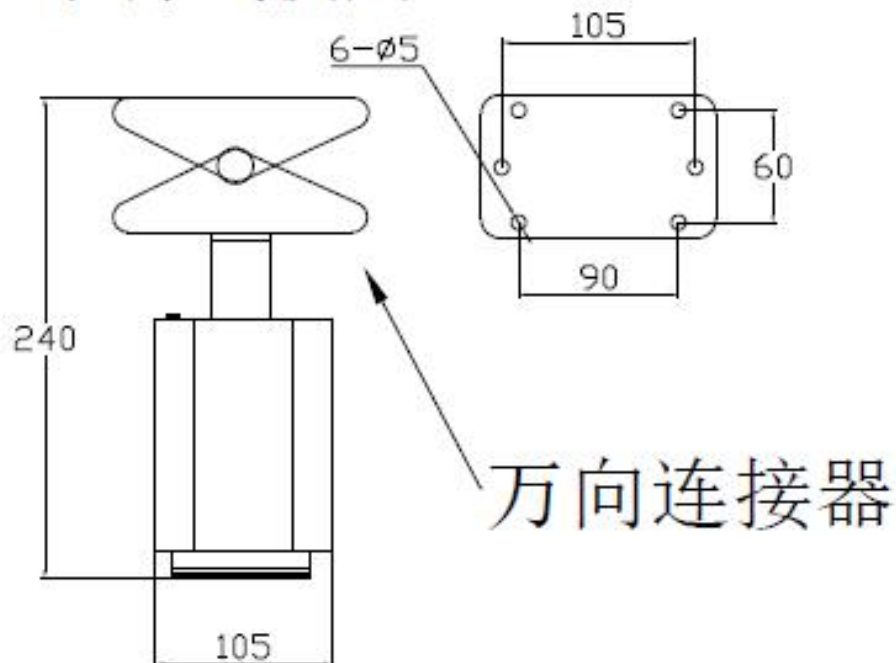
动臂式使用　used for luffing tower crane

旋转阻尼器　rotary damper

平臂式使用　used for level-jib tower crane

万向连接器　universal connector