

WTL-A(200)型 力矩限制器 TORQUE LIMITER

使用说明书
Operation Manual
[2017-4]

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国家级高新企业



国际质量体系认证



欧共体CE认证



中国船级社认证



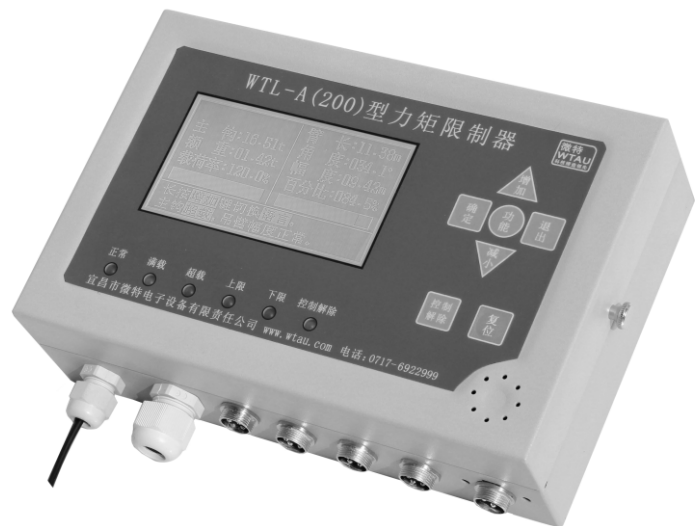
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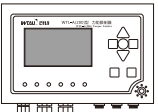
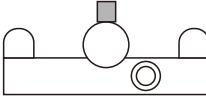
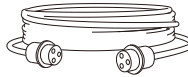

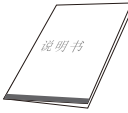



防爆认证



起重机械改造A级



 <p>主机仪表</p>	 <p>传感器 (选配)</p>	 <p>电缆 (选配)</p>
 <p>螺丝</p>	 <p>说明书</p>	 <p>合格证</p>

打开包装箱请检查力矩限制器的外观是否完好无损,清点所有配件。如有不符请立通知销售人员沟通解决。

※传感器和电缆按商务合同约定内容执行。

一、产品概述

WTL-A(200)型力矩限制器是一种对起重机正常工作、满载、超载、变幅超上限、变幅超下限等工作状态作出相应指示、报警、提示和控制的装置,以保证起重机械的正常工作的新型智能安全保护装置。整个系统由传感器、连接电缆、微电脑主机等组成。本装置是根据GB 12602-2009《起重机械超载保护装置》和GB/T 3811-2008《起重机设计规范》的有关要求设计生产的。

1、主要技术参数

显示屏: 240*128液晶屏

测量范围: 0~+999.9T(可调)

系统误差: $\leq \pm 5\%$ (F.S)

动作误差: $\leq \pm 3\%$ (F.S.)

工作电压: AC220V $\pm 5\%$ (DC24V $\pm 5\%$)

环境相对湿度: 95% RH (25°C) 不结露

环境温度: -20°C -- +60°C

继电器触点容量: 220VAC 5A

报警音量: > 60db

输入信号: ≤ 5 路

控制输出: ≤ 5 路(开关量)

其他输出: 4--20mA(定制)

Rs485(定制)

防护等级: IP64

安装方式: 壁挂/支架

2、报警控制功能

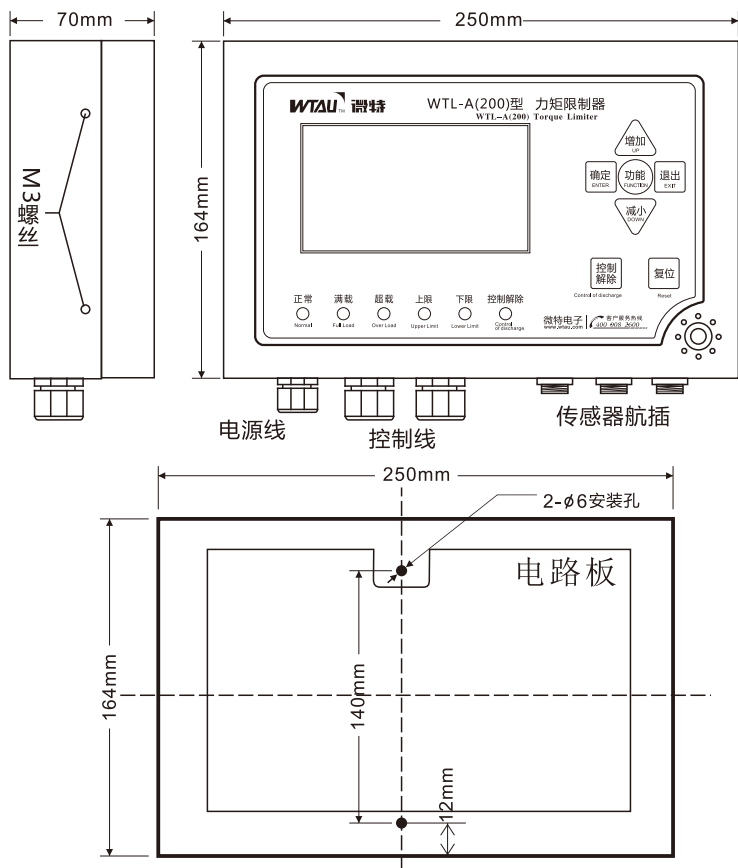
当起重力矩达到额定起重力矩的90%以上时,可以发出清楚、明显的声光预警信号(灯光为黄色);

当起重力矩达到额定起重力矩的100%以上时,可以发出清楚、明显的声光报警信号(灯光为红色),且只有在降低到额定工作能力的100%以内时报警才会停止;

当起重力矩达到额定起重力矩的110%时,立即输出超载控制信号,配合起重机控制电路停止向危险方向(如起升、增幅)的动作,但可以向安全方向(如下降)动作。

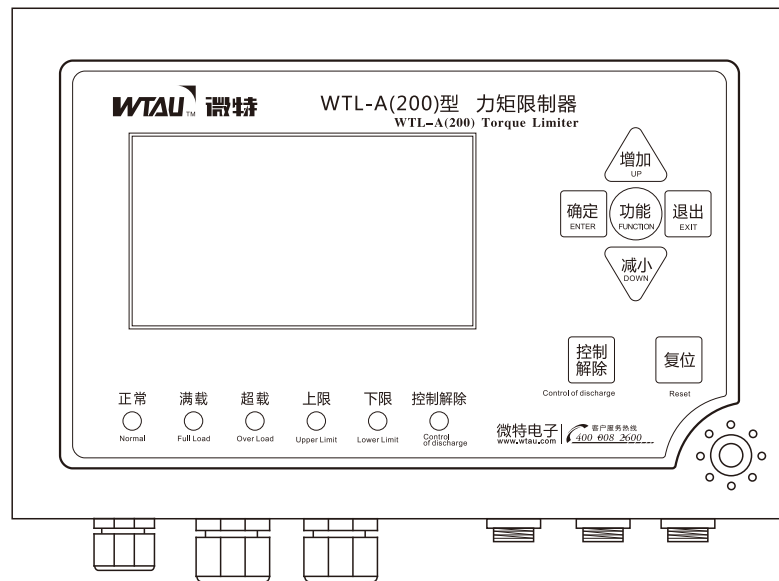
二、安装连接

本仪表为壁挂式安装，可固定在司机室墙壁上，安装方法如下：



1. 卸下M3螺钉,翻开机盖;
2. 用合适的螺钉将仪表固定在驾驶室内;
3. 根据端口定义将信号线及控制线正确连接;
4. 盖上仪表盖,恢复M3螺钉安装。

三、仪表面板及按键介绍



1、按键功能介绍

- 增加** 键：数字增加1、菜单切换到上一项；
- 减少** 键：数字减少1、菜单切换到下一项；
- 确定** 键：确定（主菜单时可进入工况切换）；
- 退出** 键：放弃修改、返回上一级菜单；
- 功能** 键：进入功能菜单、输入数字时移动光标；
- 复位** 键：仪表MCU工作复位；
- 控制解除**：控制解除、状态切换（需密码）。

2、指示灯功能介绍

- 正常（绿灯）**：表示仪表主机正常工作亮灯；
- 满载（黄灯）**：重量超过预设的满载值时亮灯；
- 超载（红灯）**：重量超过预设的额重值时亮灯；

上限（红灯）：幅度小于设定的最小幅度值时亮灯；
 下限（红灯）：幅度大于设定的最大幅度值时亮灯；
 控制解除（黄灯）：处于控制解除状态时亮灯；

四、仪表调试说明

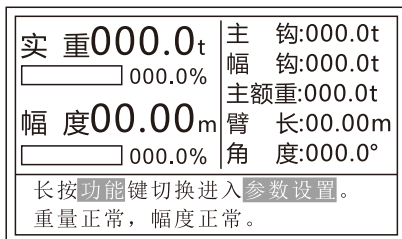
1、进入密码设置

注：仪表配置不同，显示界面会稍有不同。

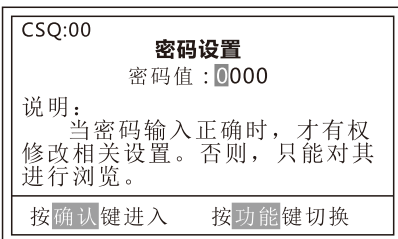
仪表上电，显示界面如下图(图1)：

下方显示吊车当前工作数据。下方显示工况切换方法及吊车工作情况，滚动显示。

在正常界面下按 **功能** 键，进入密码设置界面，如下（图2）：



(图1)



(图2)

按 **增加** 或 **减小** 键改变数值，按 **功能** 键移到下一位数值，按 **确定** 键进入，按 **退出** 键放弃并返回主界面。

当密码输入错误时，将进入“浏览模式”，里面所有的菜单项目只能查看，不能修改。只有密码输入正确时才能进入“修改模式”和“标定模式”，在这两种模式下可以对相关菜单内容进行修改设置。

2、菜单选择

菜单界面如下图(图3)：

在“菜单选择”界面按 **增加** 或 **减小** 键移动光标位置，按 **确定** 键进入相应参数设置界面。



(图3)

“菜单选择”用于选择待进入菜单。

- “系统参数设置”用于修改与系统及设备相关的一些参数。
- “报警参数设置”用于修改与报警及控制相关的一些参数。
- “重量一标定”、“重量二标定”用于修改与相应钩重量值相关的一些参数。
- “臂长标定”用于标定可伸缩臂的臂长。
- “幅度标定”用于修改与幅度值相关的一些参数。
- “起重载荷表”用于显示起重机载荷特性表。

操作说明按 **增加** 或 **减小** 键选择待进入菜单，按确定键进入下一级菜单。

3、系统参数设置

系统参数界面如下图(图4)：



(图4)

“系统参数设置”用于修改与系统及设备相关的一些参数。

- 倍率：设备的起重绳倍率，该值在系统中参与计算。
- 臂长：设备的臂长值（对于汽车吊等需标定臂长的，在此无需设定）。
- 副臂：设备的副臂长度
- 中心距：设备的中心距(臂架根部下绞点到起重机旋转中心的距离)

- e、主钩头：主钩钩头重量
- f、副钩头：副钩钩头重量
- g、副臂夹角：主臂与副臂之间的夹角
- h、工况：此时工况仅做显示用

操作说明：（以修改倍率值为例说明）

a、按[增加]、[减小]键移动光标到“倍率”参数上。

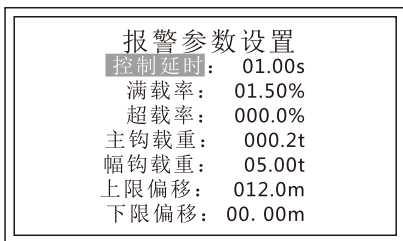
b、按[确定]键进入“倍率”参数的修改模式。

按[功能]键切换待修改数字，按[增加]、[减小]键对待修改数字进行修改。按[确定]

键保存退出，或按[退出]键不保存退出。

4、报警参数设置

报警参数界面如下图(图5)：



(图5)

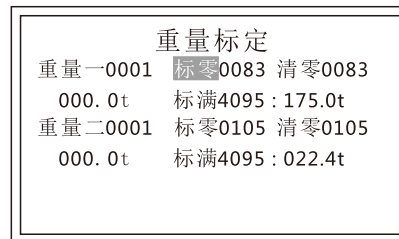
“报警设置”用于修改与报警及控制相关的一些参数

- a、“控制延时”当显示达到设定的控制点时延时xx秒后继电器动作。（此数值范围在0-20秒之间）
 - b、“满载率”系统起重的满载报警点百分比，一般设90%；
 - c、“超载率”系统起重的超载控制点百分比，一般设100%；
 - d、“偏载”用于可抬吊的吊车，设置偏载量
 - e、“幅度上限偏移”、“幅度下限偏移”相应控制参数值偏移（一般无需设置）。
 - f、“偏载”左右或上下重量偏载值大于设定值时偏载继电器控制；
 - g、“欠载”当前重量小于欠载点设置的重量时给出控制点
 - h、“松绳率”以重量清零模数值为基准，重量模数值减少清零模数值对应比例后给出控制点；
 - i、“控制风级值”设定控制输出的风机制；
- 操作说明：（以修改“控制延时”为例说明）**

- 1、移动光标到“控制延时”参数上。
- 2、修改数字，按[增加]、[减小]键对待修改数字进行修改。按[确定]键保存退出，或按[退出]键不保存退出。

5、重量标定

重量标定界面如下图（以“重量一标定”为例）(图6)：



(图6)

重量标定说明：

“重量标定”用于设定重量模数值与显示吨位的关系。

- a、“重量标零”确定重量零点与模数值的对应关系。
- b、“重量标满”确定重量满度与模数值的对应关系。
- c、“重量清零”在现场用于重量零点的迁移。

备注：

重量标零、标满用于确定重量零点与满度之间的两点关系。

重量清零用于重量零点的迁移。但不影响零点与满度之间的两点关系。

重量标定操作说明（进入标定模式）：

A.在不吊重物（即空钩）的情况下，进行重量标零（空钩离地1米），此时模数值应在大于20，小于4095。

- a、按[增加]、[减小]键移动光标到重量标零上。
- b、按[确定]键进入重量标零。此时，重量标零后的模数值显示为当前模数值，光标停留在标定值上。
- c、按[确定]键保存退出，或按[退出]键不保存退出。

B.在起吊已知重物（≥额重50%）的情况下（如150T），离地1米稳定后，进行重量标满。

- a、按[增加]、[减小]键移动光标到重量标满上。
- b、按[确定]键进入重量标满。此时，重量标满后的模数值显示为当前模数值，光标停留在标定值上。

c、按功能键切换待修改数字，按[增加]、[减小]键对待修改数字进行修改（使显示150T）。按[确定]键保存退出，或按[退出]键不保存退出。

C.重量标定结束，此时仪表显示重量应该和所吊重物一致。

现场清零过程（当使用一段时间后，空钩时零点发生较大变化，可通过清零来平移标定的线性关系）。

a、按[增加]、[减小]键移动光标到重量清零上。

b、按[确定]键进入重量清零的修改模式。此时，重量清零后的模数值显示为当前模数值，光标停留在标定值上。

c、按[确定]键保存退出，或按[退出]键不保存退出。

备注：“重量标零”、“重量标满”在“修改模式”下可以修改，“重量清零”在“修改模式”、“标定模式”下均可以修改。重量修正用于重量参数非线性修正，常规不用。

重量二标定同重量一标定方式相同。

6、幅度标定

“幅度标定”用于修改与幅度值相关的一些参数。一般情况下，分为：

- a、“角度标定”角度参数硬件上的标零、标满（出厂时已标定，一般无需标定）。
- b、“幅度标定”现场幅度标定。
- c、“幅度修正”幅度参数非线性修正。
- d、“副角标定”副角度参数硬件上的标零、标满。

幅度标定	
第一步	角度标定
第二步	幅度标定
第三步	幅度修正
第四步	幅角标定

(图7)

角度标定	
模数值:00500	角度值: 024.5°
实际幅度值:61.50m	
实际角度值:000.0°	000.0°
	模数值 标定值
角度标零: 00302	000.0°
角度标满: 01023	090.0°

(图8)

角度标定:

备注：“角度标零”“角度标满”出厂前已经设置好了,通常不用修改。

“角度标定”用于角度参数硬件上的标零、标满,用于确定角度零点与满度之间的两点关系。一般情况下，分为：

a、实际角度值：填写当前臂杆的实际角度。

测量臂杆角点与钩头垂直地面的距离，根据勾股定律算出当前角度。

b、如果角度标定完后，仪表所显示的实际幅度不对，则进行幅度标定。注意幅度标定按照幅度从大到小或者从小到大的顺序标定。

幅度标定:

幅度标定 A=000.0° S=6150m			
60.00臂	角度值	幅度值	0001
标定01:	090.0°	0100m	1.000
标定02:	-----°	-----m	-----
标定03:	-----°	-----m	-----
标定04:	-----°	-----m	-----
标定05:	-----°	-----m	-----
功能键切换工况。			1.500

(图9)

幅度标定操作说明：

a、将吊车臂杆趴到最小幅度。

按确定键，角度值栏下面（标定01）显示当前角度值，幅度值下面显示修改值。根据当前实际幅度值修改即可。

b、将吊车臂杆升到最大幅度。

按确定键，角度值栏下面（标定02）显示当前角度值，幅度值下面显示修改值。根据当前实际幅度值修改即可。

注意：如按上面方法标定后，中间还有显示幅度与实际幅度不一致，可将幅度分为10段进行非线性标定。

7、臂长标定

臂长标定		
模数值:	0056	臂长值: 0.985m
	模数值	标定值
臂长标零:	0200	11.00m
臂长标满:	3200	35.00m

(图10)

“臂长标定”用于标定臂长值。一般情况下，分为：

- “臂长标零” 设置臂长的零点（基本臂长）。
- “臂长标满” 最大臂长标定。

臂长标定操作说明：

A、将臂全部收回

- 按 **增加**、**减小** 键移动光标到臂长标零上。
- 按 **确定** 键进入臂长标零。此时，臂长标零后的模数值显示为当前模数值，

光标停留在标定值上。

- 按 **增加**、**减小** 键将标定值修改成基本臂长
- 按 **确定** 键保存退出，或按 **退出** 键不保存退出。

B、将臂全部伸出。

- 按 **增加**、**减小** 键移动光标到臂长标满上。
- 按 **确定** 键进入臂长标满。此时，臂长标满的模数值显示为当前模数值，光

标停留在标定值上。

- 按 **增加**、**减小** 键将标定值修改成最大臂长。
- 按 **确定** 键保存退出，或按 **退出** 键不保存退出。

备注：“臂长标定”在“标定模式”下可以修改。

8、起重载荷表

在主界面按“确定”键或在菜单选择界面选择“起重载荷表”进入起重载荷表界面。

在起重载荷表上方显示设备工况，按“功能”键切换工况，按“确定”设置工况，根据工作模式一共可设置0000-0045共46种工作模式。

载荷表		125t主钩	
幅度值	额重值	幅度值	额重值
23.60M	125.0t	40.00m	053.0t
25.70M	125.0t	45.00m	040.5t
28.00M	107.0t	50.00m	034.0t
31.50M	087.5t		
35.50M	070.0t		

按**确定**键设置，按**功能**键切换

(图11)

9、变送输出——标定

界面如下图（图12）

变送输出——标定	
4mA硬件标定	20mA硬件标定
当前值: 00.15t	
输出值: 04.04mA	
4mA标定对应: 00.00t	
20mA标定对应: 60.00t	

(图12)

- 4mA标定对应----4mA输出对应的重量或高度值的设定；
- 20mA标定对应----20mA输出对应的重量值的设定

五、仪表维护及常见故障处理

1、仪表的维护

- 按标识及接线图正确安装本系统；
- 本产品属于精密仪表，注意防水，离人断电；
- 谨慎操作，非专业人员或无专业人士指导请勿操作；
- 精度校正周期为3~6个月一次，定期检查，维护。

2.故障排除

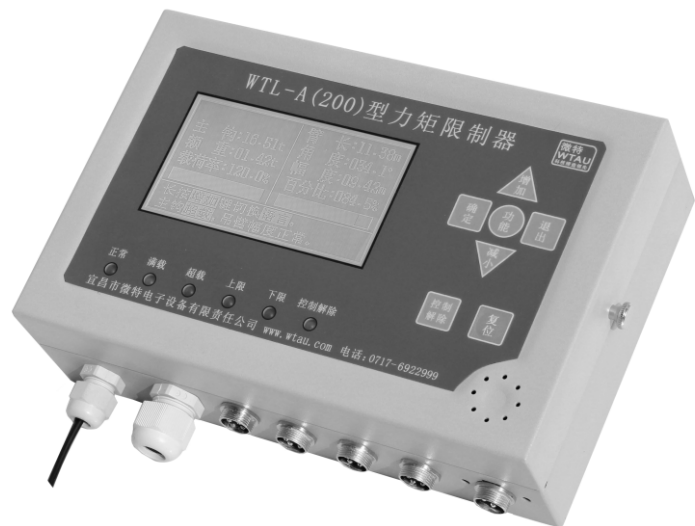
- 仪表通电无显示、指示灯不亮
处理方法：检查有误供电，检查保险管是否正常或咨询厂家；
- 超载后蜂鸣器不报警
处理方法：检查设置是否正确或质询厂家；
- 起吊后显示误差过大
处理方法：重新操作标定步骤。

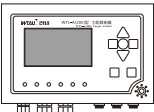
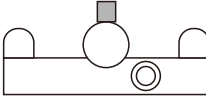
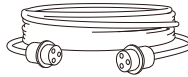



六、服务体系

WTL-A(200)型力矩限制器质保期为一年。（自交付之日起12个月内，因用户的非正常使用，电源电压超标以及其它外力造成的损坏不在质保范围内。）

※本标准产品(不含定制)功能最终解释权属微特公司所有。

产品返修时请注明详细的故障现象、使用工地、联系方式等内容。



 <p>host instrument</p>	 <p>sensor(option)</p>	 <p>electric wires (option)</p>
 <p>Screws</p>	 <p>Operation Manual</p>	 <p>Inspection Certificate</p>

Please confirm if the hoisting weight limiter appearance is in good condition and check all the components, if anything is missing, please contact with seller.

※ Sensors and cables is business contract matching parts .

1. Product Description

WTL - A(200) torque limiter is a kind of the normal work of the crane, full load and overload, amplitude limit, amplitude limit of instructions and the working state of the corresponding alarm, judgment, control devices, to guarantee the normal work of the hoisting machinery of the new intelligent safety protection device. The whole system consists of sensors, connected cables and microcomputer hosts. This device is designed according to the requirements of GB 12602-2009 "lifting machine overload protection device" and GB/T 3811-2008 "crane design specification".

1. Technical Specifications

Screen : 240*128LCD screen

Weight test range: 0~ +999.9T (adjustable)

System error : $\leq \pm 5\%$ (F.S)

Action error : $\leq \pm 3\%$ (F.S.)

Work voltage: AC220V $\pm 5\%$ (DC24V $\pm 5\%$)

Work relative humidity : 95RH (25°C) no condensation

Ambient temperature : -20°C ~+60°C

Relay contact capacity : 220VAC 5A

Alarm volume : > 60db

input signal : ≤ 5

Control output : ≤ 5 (switching)

Other output : 4--20mA (Option)

Rs485 (Option)

Protection grade : IP64

Installation mode: wall/bracket

2. Alarm Control Function

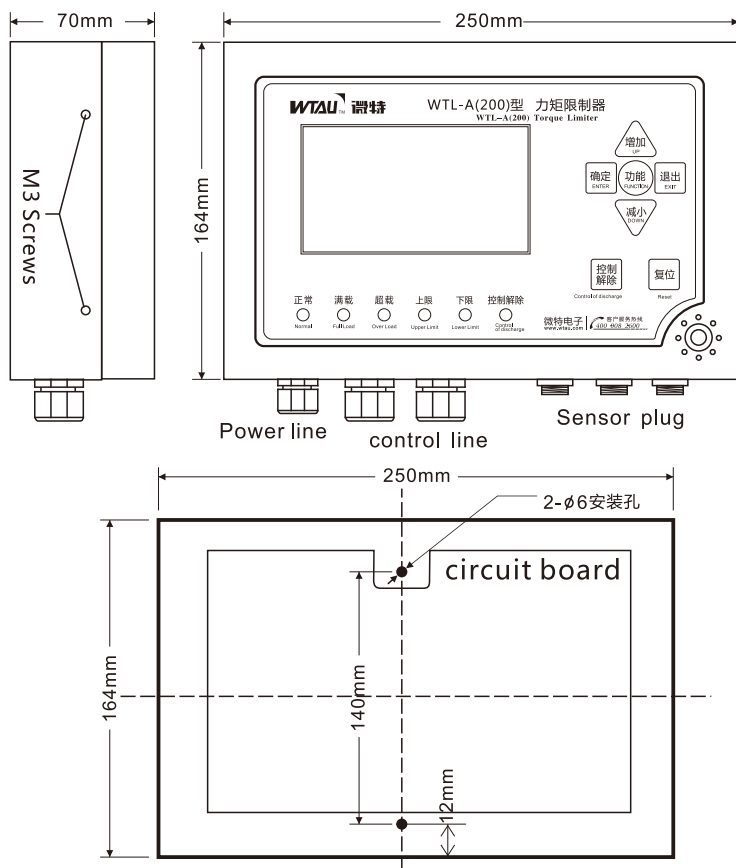
When the torque reaches 90% of the rated load moment, it gives loud and clear sound and light alarm signal (amber light)

When the torque reaches 100% of the rated load moment, it gives loud and clear sound and light alarm signal (red light). The alarm stops only when the torque is lower than 100% of the rated load moment.

When the torque reaches 110% of the rated load moment, it sends out overload control signal and working together with the control circuit to stop the crane from moving towards dangerous directions (for instance, lifting, increasing radius / scope). Movements toward safety directions are allowed (for instance, lowering).

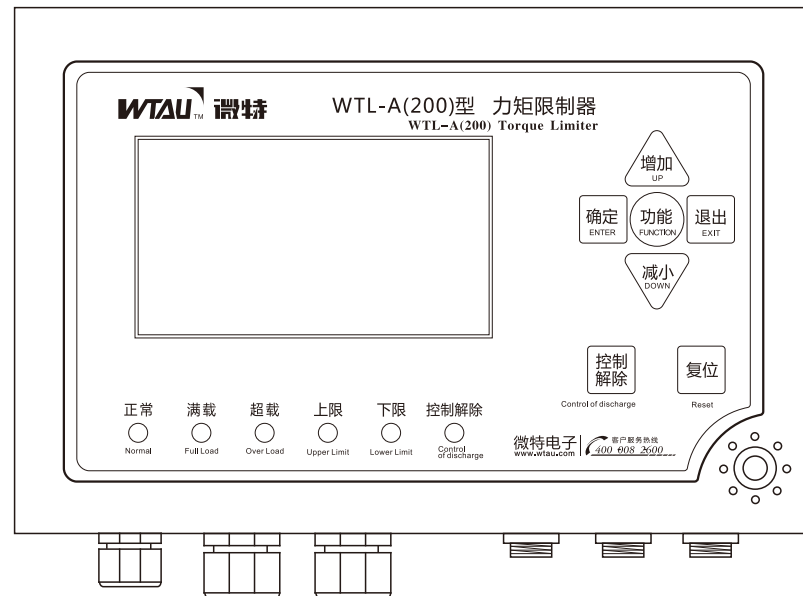
2. Installation and Connection

The instrument can be fixed to the wall of the driver cab. The procedure of installation is as follows:



1. Unload M3 screws ,open the machine lid;
2. Use appropriate screw to fix instrument in the driving room ;
3. According to the port description connect power lines and control lines ;
4. cover the machine lid, restore install the M3 screws.

3. Panel introduce



1. Function of Button

- UP** key : Press “UP” to increase the number by one, switch to the last menu ;
- DOWN** key : Press “DOWN” to decrease the number by one, switch to the next menu ;
- ENTER** key : Press “ENTER” to select or confirm (can switch working conditions when in main menu);
- EXIT** key : Cancel changes and back to previous menu;
- FUNCTION** key : Enter “FUNCTION” menu, move the cursor when inputting numbers;
- RESET** key : Reset the instrument MCU;
- Control of discharge** key : Switch between control and release .

2. LED light function

- Normal (green light) : indicates that the instrument host works properly.
- Full load (yellow light) : light when the weight exceeds the set load.

Overload (red light) : the light is brighter when the weight exceeds the set amount.

Upper limit (red light) : the light is lighter when the magnitude is less than the minimum set.

Lower limit (red light) : brighter than the maximum set maximum.

Control of discharge (yellow light) : be in control to remove the status of the light;

4.Display Calibration

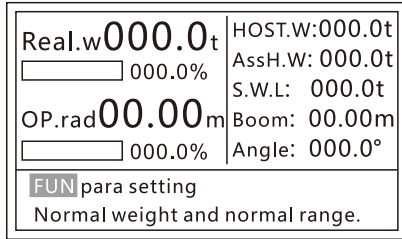
1.Password Settings

Remark: different instrument configuration, display interface will be slightly different.

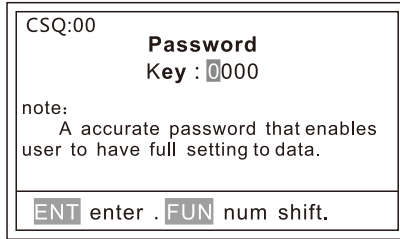
Instrument power on, the display interface shows as below(PIC1):

At the below of the screen shows the current working data of crane and the bottom operating mode switching method and crane work status, scrolling display.

Press “Function” at normal interface to enter Password Settings as demonstrated below. (PIC2) :



(picture1)



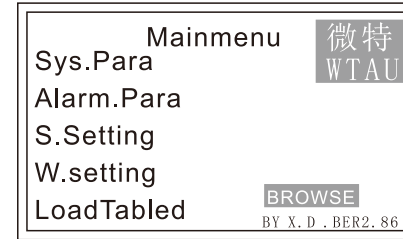
(picture2)

Press “UP” or “DOWN” to change the numerical value. Press “FUNCTION” to move to next digit. Press “ENTER” to enter and “EXIT” to abandon operation and return to main interface.

When wrong passwords are entered, the user will be in “Browse Mode”, i.e., the parameters can be viewed but not changed. Only the correct password will lead to “Change Mode” and “Setting Mode”, under both of the two modes, parameters can be set and reset.

2.Main menu Selection

Main menu interface as below(picture3)



(picture3)

Move the cursor by press “UP” or “DOWN” at “Main menu”, press “ENTER” to enter parameter setting interface.

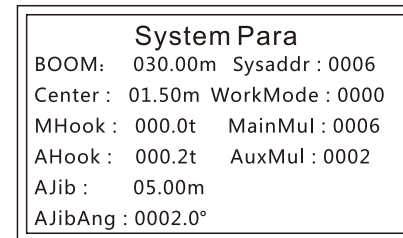
“Main menu” is for choosing the menu you want to enter.

1. Select “System Para” to change the parameters related to the systems and relevant devices.
2. Select “Alarm Para” to change the parameters related to alarms and controls.
3. Select “W.(Weight)1 Setting” and “W.(Weight) 2 Setting” to change the parameters of the load of the related hook.
4. Select “Boom Setting” to determine the boom length of the telescopic boom.
5. Select “S(Scope) Setting” to change parameters related to radius(scope).
6. Select “Load Table” to display the designed working load of the crane.

Operating instruction: press “UP” or “DOWN” to select the menus. Press “ENTER” to enter the next menu”.

3.System Parameter Settings

System parameter show as below(PIC4) :



(picture4)

Select “System Para” to change the parameters related to the systems and relevant devices.

1. “Mul”: change the multiplying power/parts/reaving of the hoisting rope. The

value is involved in calculation in the system.

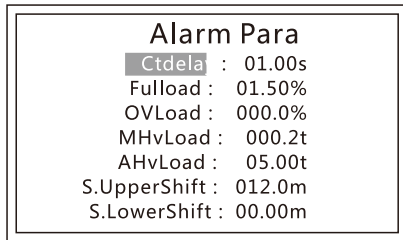
2. “Boom”: change the boom length of the crane (no need to change the determined boom length of track cranes, etc.)
3. “AJib”: change the length of the Auxiliary Jib
4. “Center”: change the distance to the center (distance from the boom root under ground point to the center of rotation of the crane)
5. “Hook M”: the load on the main hook
6. “Hook A”: the load on the auxiliary hook
7. “AjibAng”: Angle between main jib and auxiliary jib.
8. WM: the work mode here for display only.

Operating Instructions: (taking Mul(Multiplying power) Value as an example)

1. Press “UP” or “DOWN” to move the cursor to “Mul”.
2. Press “ENTER” to modify the parameters of “Mul”.
3. Press “FUNCTION” to switch the items to be modified. Press “UP” or “DOWN” to modify the numerical value. Press “ENTER” to save the modification and quit, or “EXIT” to quit without saving the modification.

4.Alarm Parameter Settings

Alarm parameter interface shows as below (PIC5) :



(picture5)

Select “Alarm Para” to change parameters related to alarm and control.

1. “CtrDelay(Control Delay)”: delay xx seconds (range from 0-20 seconds) when reaches preset point before the Relay operates.
2. “FuLoad (Full Load Rate)”: the ratio of actual load of the system to full load, usually set at 90%.
3. “OvLoad (Overload Rate)”: the ration of actual load of the system to overload control point, usually set at 100%.
4. “Wp Load”: the capacity of unbalanced load (for double crane hoisting).
5. “S(Scope). Upper Shift”, “S(Scope). Lower Shift”: skew the relevant control parameters (normally no need to setup)

6. “Wp Load”: the value of unbalanced load for left and right or up and down bigger than the present value, unbalanced load relay control;

7. “Urload(Under Load)”: current load weight is smaller than the preset under load value, “under load” relay control.

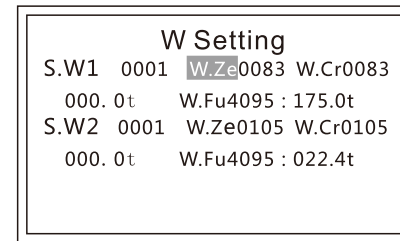
8. “Loose rope rate” takes weight reset A/D modulus value as a benchmark, weight modulus value reduce, control points is given after reset modulus value corresponding to the proportion;

Operating Instructions: (taking “CtrDelay(Control Delay)” as an example)

1. Move the cursor to “CtrDelay”.
 2. Change the numerical value by press “UP” or “DOWN”.
- Press “ENTER” to save the change and quit, or “EXIT” to quit without saving the change.

5.Weight Setting

Weight Setting interface is as follows (taking W1 (Weight 1) Setting as an example) (PIC6):



(picture6)

Weight calibration:

1. “W1(Weight 1) Setting”: weight set zero, weight set full and weight clear zero of Weight 1 parameters on hardware.
 2. “W.Corr(Weight Correction)”: non-linear adjustment of weight parameters (for trained professionals only)
- Weight Setting Instructions:
- “W(Weight) Setting” is designed to set up the relation between the simulated numerical value and displayed tonnage.
1. “WSetZero(Weight Set Zero)”: determine the relation between point zero and AD(the simulated numerical) value.
 2. “WSetFull(Weight Set Full)”: determine the relation between weight full scale and the AD(simulated numerical) value.
 3. “WClrZero(Weight Clear Zero)”: zero clearing on site.

Remark:

“WSetZero(Weight Set Zero)” and “WSetFull(Weight Set Full)” are used for establishing the relation between weight zero and full scale.

“WClrZero(Weight Clear Zero)” is used to remove the Weight Zero. It does not affect the relation between the point zero and full scale.

Operating Instructions for Weight Setting (enter Setting Mode):

1. When the crane is not lifting (i.e., hook in idle), proceed the WSetZero(Weight Set Zero) (idle hook 1m above the ground). The A/D(simulated) value should be within the range of 20-4095.

- a. Press “UP” or “DOWN” to move the cursor to WSetZero(Weight Set Zero)
- b. Press “ENTER” to begin calibration. Now, the displayed value is the same with the simulated value after WSetZero(Weight Set Zero). The Cursor stays at the calibrated value.
- c. Press “ENTER” to save the change and quit, or “EXIT” to quit without saving the change.

2. When lifting goods whose weight (≥50% of the rated load capacity) is known (say 150T), start Weight Set Full when it stabilizes 1meter above the ground.

- a. Press “UP” or “DOWN” to move the cursor to WSetFull(Weight Set Full).
- b. Press “ENTER” to begin Weight Set Full. Now, the displayed value is the same with the A/D (simulated) value after Weight Set Full. The Cursor stays at the calibrated value.
- c. Press “FUNCTION” to switch the items to be changed. Press “UP” or “DOWN” to change the numerical value. Press “ENTER” to save the change and quit, or “EXIT” to quit without saving the change.

3. After Weight Calibration, the weight displayed on the instrument should be in accordance with the load on hook.

On-site clearing procedure (having been operating for a period of time, the zero point of the idle hook may change considerably. By clearing, you can reset the calibrated linear relation)

- a. Press “UP” or “DOWN” to move the cursor to Weight Clearing.
- b. Press “ENTER” to begin clearing. Now, the displayed value is the same with the simulated value after clearing. The Cursor stays at the calibrated value.
- c. Press “ENTER” to save the change and quit, or “EXIT” to quit without saving the change.

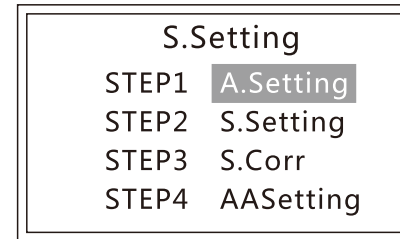
Note: “Weight Set Zero” and “Weight Set Full” can be reset under “Change Mode”; “Weight Clear Zero” can be reset under both the “Change Mode” and the “Setting Mode”. Weight Correction is applied only onto weight parameter non-linear correction. It is not used on regular basis.

The procedure for Weight 2 Setting is the same with Weight 1 Setting.

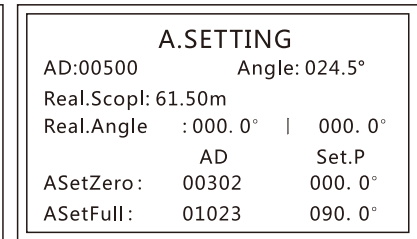
6.Scope (Radius)Setting

“S.(Scope) Setting” is used for changing the parameters related to scope/radius. In normal situations, it can be categorized into:

1. “A.(Angle) Setting”: A SetZero and A SetFull of angular parameters on hardware (preset in factory, so no need to reset).
2. “S.(Scope) Setting”: to calibrate scope on site.
3. “S. Corr(Scope Correction)”: to correct non-linear parameters of the scope.
4. “JibA Setting”: A SetZero and A SetFull of jib-angular parameters on hardware.



(picture7)



(picture8)

Angle Setting instruction:

Operating instruction:

Press “FUNCTION” to select the menu you want to enter and then press “ENTER” to enter the next menu.

Angle Setting instruction

Note: the parameters can be changed only under “Change Mode”. Angle Set Zero and Angle Set Full have been set up in factory and thus do not require adjustment in general.

Functions:

“A.(Angle) Setting” is used for Zero setting and Full Scale setting of angular parameter on hardware and for the establishment of relation between Point Zero and Full Scale. Usually, it can be classified into:

1. “Real Angle”: fill in the current actual Angle of the boom.
Measuring distance from the boom angle point and the hook vertical to the ground, according to the law of Pythagorean theorem to calculate the current angle.
2. “ASetZero(Angle Set Zero)”: determine the relation between point zero and the A/D.
3. “ASetFull(Angle Set Full)”: determine the relation between angle full scale and the A/D.

S.(Scope) Setting instruction

Interface for calibration as below:

After the Angle setting, if the actual scope shows wrong from the instrument, then do the scope setting/calibration. Note that the scope setting shall be in the order from large to small or from small to large.

Scope setting instruction:

1. Make the crane boom to be minimum scope, Press ENTER key, Angle value SET-01(calibration)displays the current Angle value, below the Scope shows modified values . Modify according to the actual current scope value.

2. Raise the crane boom up to the maximum scope. Press ENTER key, SET-02 (calibration)displays the current Angle value, below the Scope shows modified values . Modify according to the actual current scope value.

Remark: If after calibration by the above method, there is still displayed scope are inconsistent with the actual scope, the scope setting can be divided into 10 sections of nonlinear calibration.

S.(Scope) Setting instruction

S.Setting	A=000.0°	S=6150m
60.00Bm	Angle	Scope 0001
SET-01:	090.0°	0100m 1.000
SET-02:	-----°	-----m -----
SET-03:	-----°	-----m -----
SET-04:	-----°	-----m -----
SET-05:	-----°	-----m -----
FUN Shift Corwm.		1.500

(picture9)

After the Angle setting, if the actual scope shows wrong from the instrument, then do the scope setting/calibration. Note that the scope setting shall be in the order from large to small or from small to large.

Scope setting instruction:

1. Make the crane boom to be minimum scope, Press ENTER key, Angle value SET-01(calibration)displays the current Angle value, below the Scope shows modified values . Modify according to the actual current scope value.

2. Raise the crane boom up to the maximum scope. Press ENTER key, SET-02 (calibration)displays the current Angle value, below the Scope shows modified values . Modify according to the actual current scope value.

Remark: If after calibration by the above method, there is still displayed scope are inconsistent with the actual scope, the scope setting can be divided into 10 sections of nonlinear calibration.

7.Boom Setting

Boom.Setting		
AD:	0056	Boom : 0.985m
	AD	Set.P
Boom.Min:	0200	11.00m
Boom.Max:	3200	35.00m

(picture10)

“Boom Setting” is for calibrating boom length. In general, it can be classified into:

1. “Boom. Min”: to reset the zero point of boom length (basic boom length)
2. “Boom. Max”: to calibrate the maximum boom length.

Operating Instructions:

A. Draw back the boom completely

- a. Press “UP” or “DOWN” to move the cursor to “Boom. Min”
- b. Press “ENTER” to begin calibrating. Now, the displayed value is the same with the AD(simulated) value after calibration. The Cursor stays at Set.P .
- c. Press “UP” or “DOWN” to change the Set.P to maximum basic boom length.
- d. Press “ENTER” to save the change and quit, or “EXIT” to quit without saving the change.

B. Extend the boom completely

- a. Press “UP” or “DOWN” to move the cursor to “Boom. Max”
- b. Press “ENTER” to begin calibrating. Now, the displayed value is the same with the AD vaule after calibration. The Cursor stays at Set.P .
- c. Press “UP” or “DOWN” to change the calibrated value to maximum boom length.
- d. Press “ENTER” to save the change and quit, or “EXIT” to quit without saving the change.

Note: “Boom Setting” can be changed under “Setting Mode”.

8.Load Table

Press "ENTER" button enter the main interface, or meet in menu option to choose "hoisting load chart" to enter the hoisting load chart interface. “Working Conditions Input”: select the working conditions of the equipment from 46 different conditions range from 0000 to 0045.

LoadTab	125tM.H.		
Scople	S.W.L	Scople	S.W.L
23.60M	125.0t	40.00m	053.0t
25.70M	125.0t	45.00m	040.5t
28.00M	107.0t	50.00m	034.0t
31.50M	087.5t		
35.50M	070.0t		
ENT Shift Corwm.FUN Shift wm			

(picture11)

9. Analog output - calibration

Interface as below (PIC12) :

Da1 Setting	
4mAHardtest	20mAHardTest
CurDA : 00. 15t	
OutDA : 04. 04mA	
4mA Setting : 00.00t	
20mA Setting : 60.00t	

(picture12)

- a. 4mA calibration ----4mA output corresponding weight or height value set
- b. 20mA calibration ----20mA output corresponding weight value set

5. Tips for repair and maintenance

1. Tips for repair and maintenance

- a. according to the picture 2 correctly install the system ;
- b. Precision products, pay attention to waterproof, close the power when all the people left ;
- c. careful operation, non-professional personnel or no professional guidance do not operate; ;
- d. 3 ~ 6 months for a precision calibration cycle, regular check and maintenance.

2. Analysis and Settlement of Common Failures

- a. Display Instrument not operating, monitor not working.
Reasons: Power cord is pulled out or no electric power input; malfunction of stabilized power source; safety fuse blew out.
Solutions: check the power lines and output voltage, connect the power supply.

- b. Weight Value doesn't change.

Reason : Weight Sensor cable failure; Weight Sensor damaged or Zero and Full Scale Calibration are incorrect.

Solutions: find the break point of the cable, reconnect it according to its color and take water-proof measures; or replace the sensor and recalibrate the Weight Zero and Weight Full Scale.

- c. Upon receiving the signal, the displayed values change accordingly but in big discrepancy with the actual values and beyond the range of permissible error.

6. Product assurance

WTL-A(200) Torque limiter's guarantee period is 12 months which is from the installation acceptance delivery date on. But except follow damage reasons which are non-normal use, excessive supply voltage, and other external damage.

※ **This standard products (excluding customization) function finally explain belongs to the WTAU.**

Please indicate the specific symptoms, use site, contact information and other content when the product returned for repair.