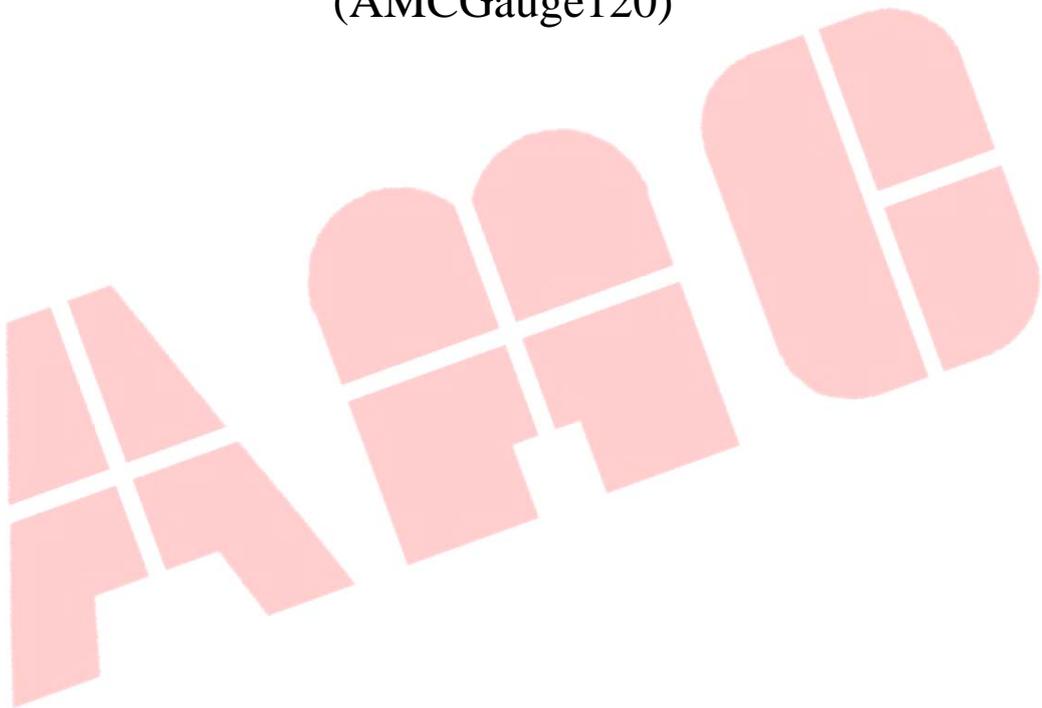


# **AMC Contact Thickness Gauge Operating Instructions**

(AMCGauge120)



**XI'AN AMCTECH CO.,LTD**

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## (AMCGauge120) System Composition Introduction

### Chapter One Measuring Principle

#### 1 AMCGauge120 System Overview

Contact Thickness Gauge is an online high-precision metal strip thickness measuring device that can quickly and accurately reflect the actual or deviation thickness of the strip during the production of metal strip. The thickness gauge is not affected by the material and chemical composition of the strip. Easy to use, reliable performance, "0" radiation, is a green product, compared to the higher accuracy of ray measurement, no impact on human health. The customer's use of the contact thickness gauge eliminates the cumbersome procedures of environmental approval and filing.

Xi'an Ai Mengxi Technology Co., Ltd. has been engaged in the research of thickness measurement technology such as cold rolling (alloy material, composite strip, stainless steel, copper, copper alloy). In practice, it has accumulated rich experience in measurement technology and mastered the imported similar thickness gauge. The key technology. Through the independent innovation and research and development of our company, we successfully launched the 120-type contact thickness gauge, and its performance and reliability have reached the international advanced level.

#### 2 Measuring Principle

The contact thickness gauge is a differential transformer inductive sensor. When the sensor is static, the core is in the middle position, and the secondary side outputs the voltage and its phase is opposite, that is, the output is zero. When there is displacement, the difference between the two is not zero, and is proportional to the displacement of the core. This voltage is sent to the phase sensitive detection, filtering, amplification, and the output current voltage is linearly proportional to the core.

#### 3 Characteristics of Contact Thickness Gauge

Thickness gauge accuracy is generally divided into static measurement accuracy and dynamic measurement accuracy. The contact thickness gauge directly measures

the thickness of the strip with the upper and lower probes, regardless of the chemical composition of the strip and the uniformity of the material. The system does not need to be calibrated frequently. Therefore, the static precision is very high. For example, the AMCGauge120 thickness gauge produced by our company has a measurement accuracy of up to  $\pm 0.001\text{mm}$ , a maximum measurement thickness of 4mm, and a measurement depth of up to 120mm from the edge of the strip. The strip runs at high speed during the rolling process (maximum rolling speed can reach 600m/min), although there are 4 nip rollers on both sides of the thickness gauge, the strips have slight fluctuations, up and down the thickness gauge. The high-precision differential transformer displacement sensor is installed in the two probes. This slight fluctuation will cause an error between the detected value and the actual value, resulting in a decrease in dynamic accuracy, but the dynamic measurement accuracy is still  $\pm 1\ \mu\text{m}$ .

The back end of the contact gage is equipped with anti-collision blocks, which are made of special fragile materials for safety protection. During the high-speed rolling process, the strip is suddenly broken or deflected due to various reasons, resulting in huge impact force and cold rolling stress, causing the strip to impact the thickness gauge, and the safety pin at the rear end of the thickness gauge will be quickly broken. To protect the thickness gauge.

#### 4 Technical Indicators

Resolution: sensor 0.0005mm;

Measuring frame travel: 400mm;

Dynamic measurement accuracy:  $\pm 0.001\text{mm}$ ;

Measuring range: 0-3mm;

Output signal: deviation  $\pm 10\text{V}$  (direct reading signal) 232 communication / parallel BCD (AGC thickness control);

Followability: 600m/min;

The maximum measuring depth of the sensor: 120mm (distance from the edge of the strip to be tested).

## Chapter Two AMCGauge120 Contact Thickness Gauge



Figure1 AMCGauge120 Contact Thickness Gauge

The contact thickness gauge produced by Xi'an Amctech Co., Ltd. consists of four parts:

- a、 U-shaped measuring body unit;
- b、 Left and right measurement amplification processing unit;
- c、 Computer detection processing unit;
- d、 Gas unit;
- e、 Trailer and mobile unit.

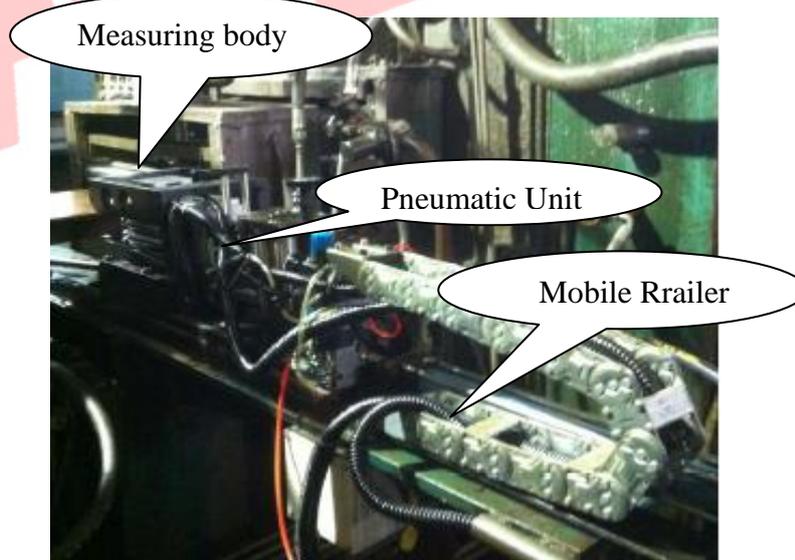


Figure 2 AMC Gauger 120 field installation diagram

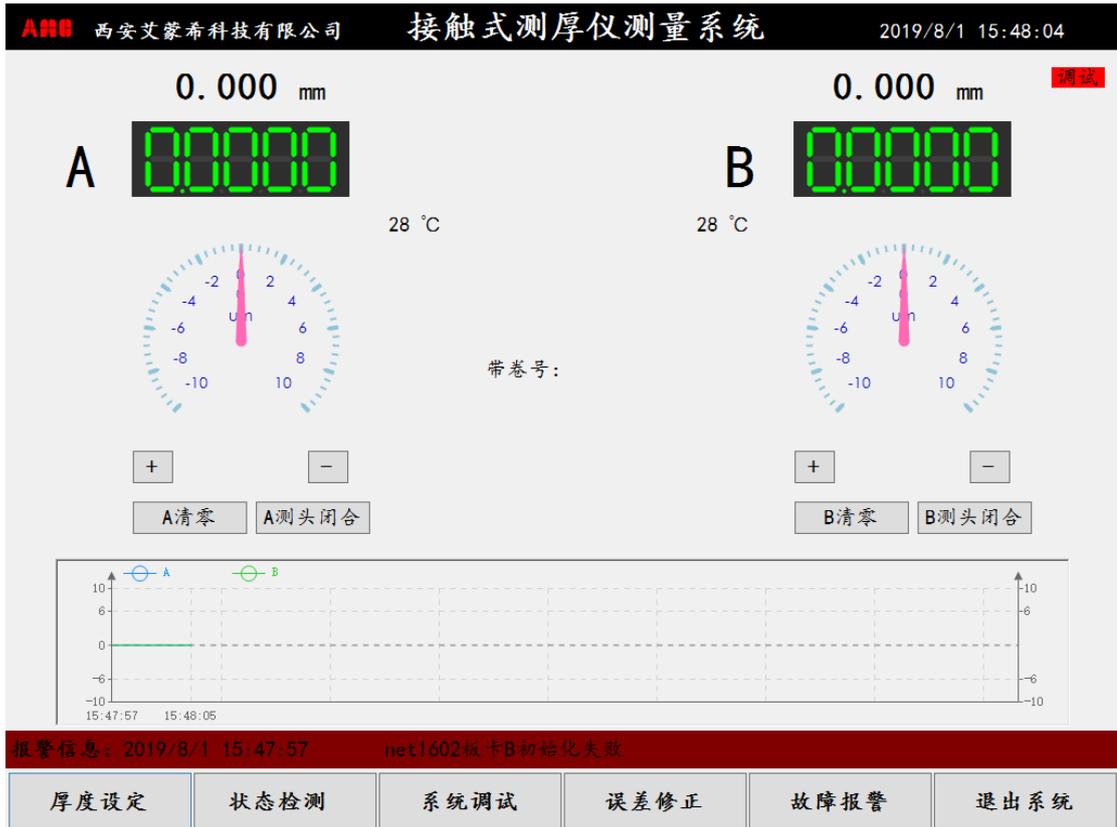


Figure 3 Thickness Gauge Measurement Main Screen



Figure 4 AMCGaugerIII Online Measurement



Figure 5 AMCGaugerIII Amplification Processing Unit

### Chapter Three Operating procedure

#### 5 Start On

Close the circuit breaker of the gage control cabinet to supply power to the system. Start the Windows system by clicking the Power button on the back of the thickness gauge computer controller. When the system is loaded, run the “Contact Thickness Gauge” icon on the desktop and double click to enter the following screen:

Enter the password "Amc2005", select the appropriate resolution, click the login button to enter the main screen of the thickness gauge system, as shown below:

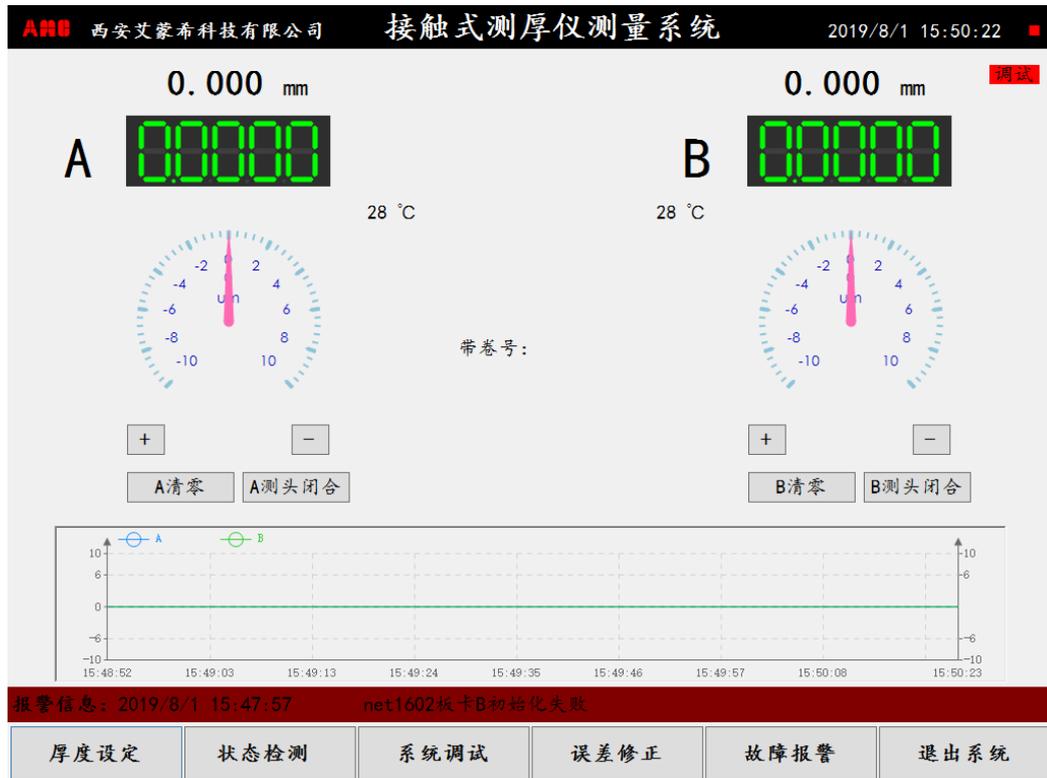


Figure 6 AMCGauge120 Main Screen

## 6 Parameter Settings

Click “System Debugging” on the main screen. The system debugging mainly includes “System Parameter 1”, “System Parameter 2” and data query screen. Click the corresponding button to enter the corresponding screen. The parameter screen is as follows:

AMC 西安艾蒙希科技有限公司
系统参数一
2019/7/30 11:43:47

### 串口通讯设置

厚度设定串口地址:

厚度设定串口波特率:

数显驱动串口地址:

数显驱动串口波特率:

厚度设定串口模式:

厚度设定BCD模式:

偏差范围 (um):

设定厚度值源:  本地  远程

备用:

备用:

备用:

备用:

备用:

备用:

备用:

备用:

### 测厚仪控制

测头A回程确认值:  mm

测头B回程确认值:  mm

A前进延时:  秒

B前进延时:  秒

测厚仪模式:

左测厚仪标定温度 (°C):

右测厚仪标定温度 (°C):

左测厚仪补偿系数:

右测厚仪补偿系数:

数据保存时间 (月):

滤波次数:

备用:

备用:

备用:

备用:

备用:

备用:

AMC 西安艾蒙希科技有限公司
系统参数二
2019/8/1 15:59:17

### A标定

A测厚仪分界点1:

A测厚仪分界点2:

A测厚仪分界点3:

A上传感器斜率1:

A下传感器斜率1:

A上传感器斜率2:

A下传感器斜率2:

A上传感器斜率3:

A下传感器斜率3:

A上传感器斜率4:

A下传感器斜率4:

A侧修正b0:

A侧修正b1:

A侧修正b2:

A侧修正b3:

A侧修正b:

### B标定

B测厚仪分界点1:

B测厚仪分界点2:

B测厚仪分界点3:

B上传感器斜率1:

B下传感器斜率1:

B上传感器斜率2:

B下传感器斜率2:

B上传感器斜率3:

B下传感器斜率3:

B上传感器斜率4:

B下传感器斜率4:

B侧修正b0:

B侧修正b1:

B侧修正b2:

B侧修正b3:

B侧修正b:

Figure 7 AMCGauge120 Parameter Configuration

In general, this screen configuration parameter does not need to be changed.

When it is necessary to repair the thickness gauge, generally switch between "debug" or "run" mode.

The data query function is as follows:



Figure 8: AMCGauge120 Date Query

Select the query condition query according to the requirements, for example, query by the volume number, select the small box after the volume number (tick), and then click the downward triangle below the volume number input box to select the corresponding volume number, again Click the Query button to perform a database query.

The “Y-axis zoom” and “Y-axis zoom” buttons respectively enlarge or reduce the range of the Y-axis of the curve. The “0.25”, “0.5”, and “1.0” in the curve settings correspond to the X-axis scaling ratios of 0.25, 0.5, and 1.0, respectively.

The Save Picture button converts the curve to a picture format for saving or printing. When the data is queried, you can click on the red box in the figure to export data or print data.

## 7 Parameter and Condition Monitoring

Click the “Status Monitoring” button on the main screen to enter the “Status

Monitoring” screen, which is convenient for the user to monitor and detect whether the working status and parameter values of each signal are correct, as shown below:



Figure 9 AMCGauge120 Operation Monitoring

## 8 Error Alarm

The gage may cause a malfunction during use. Click “Fault Alarm” on the main screen to enter the following screen to confirm the alarm information and the fault point.



Figure 10 AMCGauge120 Fault Alarm Information

## 9 System Exit

Click "Exit System" on the "Main Screen", confirm and exit the system.

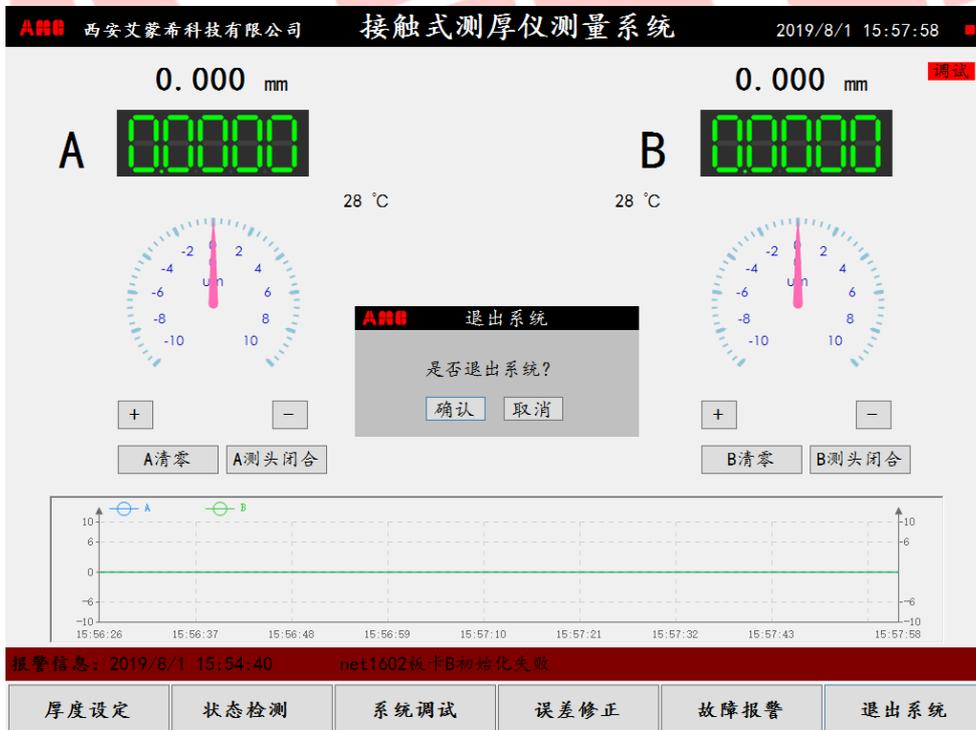


Figure 11 AMCGauge120 Operational Condition Monitoring

## Chapter Four Displacement Sensor Positioning

### 10 Sensor Initial Installation Positioning Operation

The lower probe voltage is fixed between the -100mv and +100mv. The probe is opened, the 2mm calibration plate is taken out, the probe is closed, the probe is opened, the 2mm calibration plate is placed, the probe is closed, and the probe voltage is applied. Cleared at around -2500mv.

### 11 Replace Sensor Installation and Positioning Operation

Turn off the system power, replace the probe, after the replacement is complete, turn on the system power, enter the main interface of the thickness gauge, open the probe, put in the 2mm calibration plate, close the probe, and put the voltage on the probe at -2500mv, the lower probe The voltage is between -100mv and +100mv to fix the upper and lower probes, then open the system debugging interface, set the parameter modification one, and change the coefficient of the replaced probe to the upper left (AMC) or lower left (AMC) column [if replaced) Change the probe to the upper left (AMC), change the lower probe to the lower left (AMC), click to save the parameters, exit the interface, open the probe, remove the 2mm calibration plate, close the probe, and clear.

### 12 Sensor Coefficient Adjustment

Open the probe and put it into the 0.8mm standard board to see if the measured value is 0.8mm. If the measured value deviates from 0.8mm, open the system debugging interface, set the parameter modification one, and modify the upper left (AMC) and lower left (AMC). The coefficient is the third digit after the decimal point. If the measured value is larger than the actual value, the coefficient is decreased. If the measured value is smaller than the actual value, the coefficient is increased until the measured value is the same as the actual value. At the same time, observe the temperature value of the lower left corner of the measured value of the main interface of the thickness gauge, and change the setting parameter to the lower right corner of the interface (the thickness of the thickness gauge) to the actual temperature value.

## Chapter Five Common Troubleshooting

### 13 System Can Not Start

First check whether the 24V power supply of the system is normal. If the system is powered normally and still cannot be turned on normally, you need to repair the system or redo the system. This situation is usually caused by abnormal shutdown of the system, so you must follow the normal shutdown. Shut down the program to avoid system software damage and can not start.

### 14 Communication Failed

The red light on the upper right corner of the main screen (communication indicator) flashes, and the red light flashes to indicate a communication failure. If this happens, first exit the program and reload to see if the red light is still flashing. If the red light is still flashing, you need to check the network cable connection and the network configuration is correct.

### 15 Sensor Data Error

Condition monitoring shows that the sensor data is not normal; for the probe to open and close, its operating voltage is between -4.5V and 4.5V. If the voltage is not within this range, there is a problem with the sensor value. If the communication is not normal, follow the method of question 2. If the communication is normal and the probe return value is near 0, check if the sensor amplifier module wiring of the instrument box is faulty.

## Chapter Six Consulting Method

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