BI-ZTCYT-1181 CJ-882A 数显恒温大功率磁力搅拌器美 ☒ 说明书 英

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XMTD-702 Series Temperature Control Instrument Operation Manual

I.Product Overview

The XMT702 series temperature control instrument is an upgraded product of the XMT701 type instrument. This instrument adopts European main control chips, which have the characteristics of stable operation and reliable operation. The instrument has a dual row digital display, with the upper row displaying the measured temperature value and the lower row displaying the set temperature value. The instrument also has functions such as heating indication, over temperature indication, and adaptive (self-tuning). This product is particularly suitable for water temperature control, oil temperature control, electric furnace temperature control, and oven temperature control.

The XMT702 series temperature control instruments have strong on-site adaptability, and more open parameters can be suitable for many control systems. The flexible control menu makes on-site operations simpler and easier. The optimized hardware design has improved the overall reliability of the instrument.

I.Operation Instructions

1. **Temperature setting:** Press the SET key to set the temperature. Press the SET key to flash the data of the lower row digital tube (normal temperature measurement in the upper row). At this time, the instrument enters the temperature setting state. Press the □ key to increase the set value, and press the □ key to decrease the set value. Continuously pressing the increase or decrease key will quickly change the set value. Press the shift key to move the cursor for quick setting. After setting the temperature, press the SET key again to return the instrument to normal working state.
2. **Correction of sensor error:** When confirming that the displayed value on the instrument is not the correct measurement value, the displayed value can be corrected. Press the SET key for 3 seconds to enter the inner menu of the instrument. After selecting the parameter SC, use the □ or □ keys to modify this parameter. The range for correcting sensor errors is -50 degrees to+50 degrees (for instruments with a range of 99.9 degrees, the correction range is -9.9 degrees to+9.9 degrees). After the correction is completed, press the SET key for 3 seconds to exit. The correction value of the instrument is 0 when it leaves the factory. When using it, it is important to prevent correcting the instrument that displays correctly to incorrect.
3. **Start self-tuning:** This product can adapt to the vast majority of control systems, and can only start self-tuning when the control effect is particularly unsatisfactory. Self-tuning is the process by which the instrument automatically adapts to the current heating system and selects the operating parameters. There are two ways to start self-tuning.

Method 1: Simply hold down the shift key for three seconds to enter the automatic tuning state. At this point, the At indicator light starts flashing, and the instrument enters the automatic parameter setting state. The instrument controls the heating system to fluctuate twice at the set point. When the At light goes out, the automatic setting ends, and the new PID parameters are locked in the chip.

Method 2: Press the SET key for 3 seconds to enter the inner menu of the instrument. After selecting the parameter At, press the □ or □ key to change the lower row from OFF to ON, and then press the SET key for 3 seconds to exit the tuning state while also enabling self-tuning.

II.Operation Process

1. **Set temperature:** Press the set button → Set temperature → Press the □ button to increase the set value, press the □ button to decrease the set value → Press the set button again to complete the temperature setting.
2. **Set internal function parameters:** Press the set button for 3 seconds to enter the internal menu → Modify internal parameters to adjust the basic functions of the instrument → After modifying internal parameters, press the set button to exit the function menu. The definition of internal functional parameters can be found in the Inner Layer Parameter Table. Attention: The internal functional parameters should not be adjusted arbitrarily, otherwise it may cause loss of control.

III.Definition of User Working Parameters and Inner Layer Parameter Table

Press the SET button for 3 seconds to enter the inner layer parameter setting state of the instrument.

Parameter code	Parameter meanings	Explanation	Set range	Factory value
AL1	Upper limit alarm	Set upper limit deviation alarm value	0□50	5
AL2	Lower limit alarm	Set upper limit deviation alarm value	0□50	10
FAL	Alarm action feedback	Alarm output action insensitive zone		
P	Proportional band	If P=0, it is positional control. When the P value is not zero, the instrument adopts proportional output PID control, and P is the dynamic working range.	1℃-200℃	30
Hyc	Main output return difference	This parameter can only appear when P=0, Hyc is the main output action insensitive area.	0-50	2
I	Integral time constant	Eliminate static errors and enhance the intensity of instrument control over output energy. The smaller the I value, the stronger the regulatory ability.	0-999 seconds	240
d	Derivative time constant	Pre adjustment ability refers to the speed at which the output energy is regulated when there is a change in the measured value. The larger the D value, the faster the reaction speed.	0-999 seconds	60
t	Proportional period	The total heating and termination time is one cycle. The instrument determines the output power by adjusting the heating and termination time.	1-200 seconds	20
Sc	Measurement bias	Sensor error correction: if the measured temperature is high, it is corrected upwards, otherwise it is corrected downwards.	-50℃-50℃	0
AT	Auto tuning	The instrument automatically adapts to the overheating of the heating system: 0 is off, 1 is on.	0□1	0

EP	Overimpulse resistance	Can reduce the overshoot generated by the instrument every time it is turned on, usually adding a few degrees of overshoot.	10	100
Lck	Parameter lock	0: Not locked; 1: Lock parameter 2 except for the set value: Lock all parameters	0-2	0

Parameter Description:

AL1: Over temperature alarm parameter, when the temperature exceeds the set value plus AL1 value, the ALM indicator light will light up. Example: Set the temperature to 100. Adjust AL to 10. When the temperature reaches 100+10=110, the instrument generates an alarm. At this time, the AL1 indicator light is on and the alarm relay is activated.

AL2: Low temperature alarm parameter, when the temperature exceeds the set value minus AL2 value, the AL2 indicator light will light up. Example: Set the temperature to 100. Adjust AL to 10. When the temperature reaches 100+10=110, the instrument generates an alarm. At this time, the ALM indicator light is on and the alarm relay is activated.

FAL: parameter for overshoot reduction. Used for temperature overshoot control during each cold start.

P: For the proportional band, which is the proportional control value, the instrument is centered around the set value and the P-value is distributed on both sides of the set point. Within the P-value range, the instrument operates in PID mode. Example: Set the temperature to 100 degrees. When P=30, the automatic control range of the instrument is 85-105 degrees (within the range of 30 degrees). Full power heating below 85 degrees Celsius, full cut-off heating above 105 degrees Celsius.

HYc: The return difference of the main output action prevents the output relay from frequently acting near the temperature balance alarm point during positional control (P=0). HYc can also serve as the lower limit control point for positional feedback control. Example: Set the temperature to 100. FAL adjusted to 10. When P=0, heating stops when the temperature rises to 100 degrees, and starts heating again when the temperature drops to 100-10=90 degrees. 100 degrees is the upper limit control point, and 90 degrees is the lower limit control point.

I: Used to eliminate static deviation, the actual measured temperature minus the set temperature is called static deviation. The magnitude of the I value can be understood as the theoretical time corresponding to eliminating static errors. The magnitude of the I value is related to the power and insulation performance of the heating system. Generally, a too small I value can cause temperature overshoot, which can affect the heating rate. Generally, it takes 80-360 seconds.

D: Overregulation control, when the temperature fluctuates, the instrument will make a control response within the differential time D. The instrument calculates the increase or decrease of control output energy based on the magnitude of D value combined with the speed of temperature fluctuations. A D value that is too high can cause fluctuations, while a system that is too small can react slowly. Usually 10 to 40 seconds.

T: For the heating output cycle, which is the working cycle of the relay, a small T value has a good control effect, but a too small T value will reduce the lifespan of the relay due to frequent operation. The general T-value is set at 20-60 seconds.

SC: Error correction.

AT: Self tuning parameters. After starting self tuning, the instrument automatically measures and adapts to the heating system. During self tuning, the instrument controls the heating system to fluctuate twice near the temperature set point, automatically calculating the P, I, and D control parameters suitable for the system. After the self-tuning is completed, the instrument controls the controlled system according to the new P, I, and D parameters.

LCK: Parameter locking to prevent accidental operation.

IV. Dimensions of XMTD701 (periphery 72*72*30, opening 67.5*67.5)

V.Matters Needing Attention

1. The instrument displays HHH when the measured value exceeds the instrument range or the thermocouple is disconnected, and LLL when the measured value is below the lower limit of the instrument range.
2. The instrument display is normal, but the temperature suddenly loses control. It is necessary to check whether there is a short circuit or circuit breaker in the external load. Someone is required to be on duty during the operation of this instrument.