CXT□—3000 series Intelligent Controller
Operation Manual

Ⅰ. General Introduction

CXT□ series PID Temperature Controller is the new product developed by our company. It adopts special microcomputer adjusting meter that employs switching power and surface mount technology (SMT), therefore, the controller is quite smart and reliable. Its special functions like auto diagnosing, auto setting and intelligent control. It can be used widely in the display and control of the parameter of the temperature, pressure, flow and liquid level.

Ⅱ. Main Technical Index

1. Input

Thermocouple (TC), Resistance Temperature Detector (RTD),

Standard Current and Voltage signals

2. Display

Process Value (PV), Setting Value (SV): -1999~+1999

Output (OUT1, OUT2), Alarm (ALM1, ALM2), Auto setting (AT), Display: LED

3. Control way

(1) PID Control(including ON/OFF, position PID and continuous PID);

(2) Auto Setting Control

4. Accuracy

Measurement Accuracy: 0.5%FS;

Compensation error of cold terminal: 2℃ (amend within -~50℃ by soft);

Resolution: 14bit;

Sampling period: 0.5 Sec.

5. Setting Range

Setting Value (SV): Same range with PV;

Proportional Band (P): 0~full range (ON/OFF Control when set to 0);

Integration Time (I): 0~3600Sec (No integral action when set to 0);

Derivative Time (D): 0~3600Sec (No derivative action when set to 0);

Proportional Period: 1~100Sec;

On-off control output hysteretic loop width: 1~100℃ (or other PV units).

6. Control Output

(1) Currency output: DC0~10Ma, 4~20mA(RL＜500Ω);

(2) Voltage output: DC0~5V, 1~5V(Rl＞10K);

(3) Relay output: Contact capacity: 250VAC 3A(resistive load);

(4) Voltage Impulse output: 0~12V(applicable for solid state relay SSR);

(5) Silicon Controlled Rectifier(SCR) output: Zero-cross triggering or phase shift triggering(resistive load);

(6) Alarming function output: 2 groups output at most, 12 modes Output Contact Capacity: 250VAC 3A。

7. Other Parameters

(1) Insulation resistance: ＞50MΩ(500VDC);

(2) Insulation strength: 1500V AC/min;

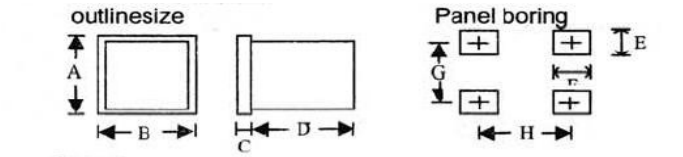
(3) Power consumption: ＜10V；

(4) Service environment: 0~50℃, 0~85RH, no corrosive gas;

(5) Weight: ~0.5Kg (C900type).

Ⅲ. Outline, Mounting, Boring and Connection

1. Outline & Boring size

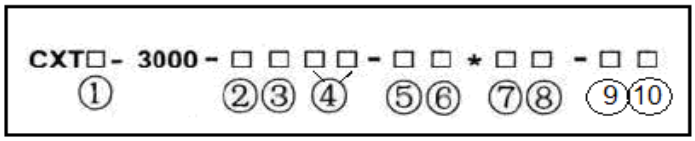


form 1

	A	B	C	D	E	F	G	H
CXTG	48	48	10	100	45	45	80	80
CXTE	96	48	10	100	92	45	116	80
CXTF	48	96	10	100	45	92	80	116
CXTD	72	72	10	100	68	68	96	96
CXTA	96	96	10	100	92	92	116	116

2. Connection Picture (take the above connection picture on the meter as the standard)

Ⅳ. Model Description and Model Selection



1. Outline size(See form 1);
2. Control type

   F: PID operation and auto calculation (Reverse operation);

   D: PID operation and auto calculation (Forward operation);
3. Input type
4. Range code: Refer to “Input Range” table;
5. First control output (OUT1) (heating side)

   M: Relay contact output,

   8: Current output (DC4~20mA)

   V: Voltage impulse output

   T: Hydration driving output
6. Second control output (OUT2)(cooling side);

   No sign: If it doesn’t have second output.

   M: Relay contact output,

   8: Current output (DC4~20mA)

   V: Voltage impulse output

   T: Hydration driving output
7. First alarm(ALM1)

   N: No alarm

   A: Upper-limit bias alarm

   B: Lower-limit bias alarm

   C: Upper/Lower limit bias alarm

   D: Alarm in area

   E: Standby upper-limit bias alarm attached

   F: Standby lower-limit bias alarm attached

   G: Standby upper/lower-limit bias alarm attached

   H: Upper-limit input value alarm

   J: Lower-limit input value alarm

   K: Standby upper-limit input value alarm attached

   L: Standby lower-limit input value alarm attached

8. Second alarm (ALM2)

   N: No alarm

   A: Upper-limit bias alarm

   B: Lower-limit bias alarm

   C: Upper/Lower limit bias alarm

   D: Alarm in area

   E: Standby upper-limit bias alarm attached

   F: Standby lower-limit bias alarm attached

   G: Standby upper/lower-limit bias alarm attached

   H: Upper-limit input value alarm

   J: Lower-limit input value alarm

   K: Standby upper-limit input value alarm attached

   L: Standby lower-limit input value alarm attached

9. Communication function

   N: No communication function.

   5: RS-485 (2-wire system)

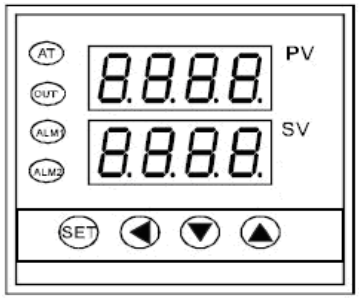
10. Communication function (2)

   N: No communication function.

   5: RS-485 (2-wire system)

Note: Please show the model referring to the above indication when order.

Ⅴ. Panel Name and Function



PV: Measurement value/Mode display value

SV: Setting value/mode display value

AT: PID auto calculation indicator lamp

OUT: Output indicator lamp

ALM1: Alarm 1

ALM2: Alarm 2 indicator lamp

▲ : Up key

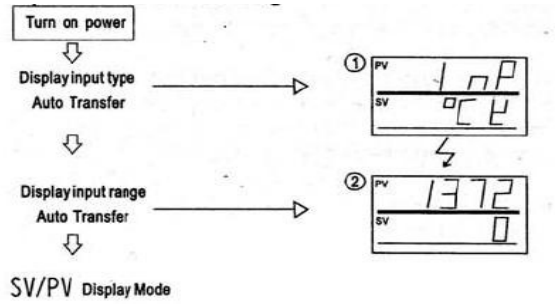
▼ : Down key

◀ : Shift key

SET: Setting mode key

Ⅵ. Operation Procedures

1. Procedures of starting



Input Type Table

Display	U	J	r	S	b	E	T	n	P	0	U	L	JP	PT	H
Input type	Thermocouple(TC)												RTD		Voltage
	K	J	R	S	B	E	T	N	PL II	W5Re/ w26Re	U	L	JPt 100	Pt 100	& Currrent

2. SV setting mode

Under SV/PV normal display state, first, press “SET” key to make the SV display in the flashing state. Second, press the “ ◀ ” key to find the place number of required setting temperature, third, press “UP” or “DOWN” key to set the required temperature. After ending the setting, press “SET” key again to let the meter come back to SV/PV normal display state.

3. Parameter setting mode

This parameter is used to set the alarming parameter, PD constant & etc. Under the normal display state, press the “SET” key for three seconds, the PV display will show the parameter setting state, and SV display will show the corresponding value. Then press “SET” key in turn to display the parameter symbol specified in the following table:

Notice: This controller has auto-return function. If the operator is amending the parameters and forgets coming back to the main display mode, the meter will return to the main display mode after 30s. Prior to using this meter or amending the parameter, please read the following information earnestly. If the meter doesn’t display the following information, it means that it is malfunctioned.

Display Symbol	Name	Description	Setting range	Factory value
	PV SV	Measurement value	Full range	
AL 1	AL1	Alarm1 setting	Full range	50.0 or 50
AL2	AL2	Alarm2 setting	Full range	50.0 or 50
ATU	ATU	Self setting	0:Auto-setting for closing 1:Auto-setting for opening	0
P	P	Proportional band (Refer to *1 for heating side) Set when PI, PD or PID control is performed.	ON/OFF action control when setting to 0 (0.0)	30 or 30.0
I	I	Integration Time(s)	1-3600 sec No derivative action when setting to 0	240
d	D	Derivative time(s)	1-3600sec No derivative action when setting to 0	60
Ar	Ar	Limit integration operation work range		100
T	T	Working cycle (s)	Time scale period 1-100 sec NO display when current outputs	Refer to*1
Pc	Pc	Proportional band (Refrigeration side OUT2)	1-1000% of Proportional Band (Heating band)	100
db	db	Insensitive area	0000-01111	0 & 0.0
t	t	Working cycle (refrigeration side)	1-1000 sec NO display when current outputs	Refer to*1
Pb	Pb	V value amendment	PV amendment	0 & 0.0
LCK	LCK	Data lock (refer to *2)	(refer to*2)	0000

Note: Some parameter signals maybe not showed.

*1.Relay contact output: 20s, voltage impulse output or driving of gas control tube is made by trigger output or gas control tube output for 2s;

*2.Data lock grade selects. Monitored only after data locked.

*3.Each alarm data (HBA, LBA, and LBD) can be locked under the following grades 0001.0011.0111

1. When LCK=0000, all data maybe amended;

2. When LCK=0001, all data may not be amended except SV, AL1, AL2;

3. When LCK=0011, all data may not be amended except SV;

4. When LCK=0111, all data may not be amended.

4. Fault information indication

When meter can't work normally, the meter diagnosed automatically to display the message prompt.

Message	Description	Solutions
Err	Meter occurs fault	Send it for repairing.
0000	The wire is disconnected at inputting, the polarity is connected inversely or above input range	Check the input signal if it is wrong.
UUUU	The wire is disconnected at inputting, the polarity is connected inversely or below input range	Check the input signal if it is wrong.

5. Setting of meter parameter mode

When the meter is energized normally, find the data lock parameter "LCK" according to the parameter setting mode, set the code to 1000, then press "SET" key to make the meter confirm, press both "SET" key and " ◀ " key at the same time for 3s, the PV display will show "Cod". When "Cod"=0000, press "SET" key in turn to display the following parameters in cycle.

Display Symbol	Setting value	Description	Remark
SL 1	0 0 0 0	K	
	0 0 0 1	J	
	0 0 1 0	L	
	0 0 1 1	E	
	0 1 0 0	N	
	0 1 0 1	T	
	0 1 1 0	U	
	0 1 1 1	R	
	1 0 0 0	S	
	1 0 0 1	B	
	1 0 1 0	W5Re/W26Re	
	1 0 1 1	P12	
	1 1 0 0	PT100	
	1 1 0 1	JPT100	
SL 2	0 0 0 0	℃ display	
	0 0 0 1	℉ display	
SL 3	0 0 0 0	Omit	
SL 4	0 0 0	No set alarm 1 function	Selection to Alarm1 (ALM1) type.
	0 0 1	Upper-limit bias alarm	
	0 1 0	Upper/lower-limit bias alarm	
	0 1 1	Process value upper-limit alarm	
	1 0 1	Lower-limit bias alarm	
	1 1 0	With alarm (Alarm in area)	
	1 1 1	Process value lower limit alarm	
	0	No standby alarm function	Selection of Alarm 1 standby function
	1	With standby alarm function	
SL 5	0 0 0 0	Setting of Alarm 2 function	Ditto
SL 6	0	Forward-operation control (Refrigeration)	Main forward/reverse operation selection
	1	Reverse-operation control (Heating)	
	0	Main control time scale output	Selection of main control output type
	1	Main control continuous output (4-20mA)	
SL 7	0	Excitation alarming	Excitation alarming/Non-excitation alarming (Alarm 1 side)
	1	Non-excitation alarming	
	0	Excitation alarming	Excitation alarming/Non-excitation alarming (Alarm 2 side)
	1	Non-excitation alarming	
SL 8	0 0 0 0	Omit	
SL 9	0 0 0 0	Omit	
SL 10	0 0 0 0	Omit	
SL 11	0 0 0 0	Omit	

When COD=0001, press “SET” key in turn to get the following parameter in circular.

Display symbol	Description
SLH	Upper limit of setting value measurement range*
SLL	Lower limit of setting value measurement range
PGdP	Place number of decimal
oH	Main output no-operation bandwidth
AH 1	Alarm 1 output no-operation bandwidth
AH2	Alarm 2 output no-operation bandwidth

When Cod=0002, all data is the recorder of meter operation, can be only seen but not amended.

Ⅷ. Input Range Table

Thermocouple

K	**K01**	0-200℃	**K02**	0-400℃	**K03**	0-600℃
	K04	0-800℃	**K05**	0-1000℃	**K06**	0-1200℃
	K07	0-137 2℃	**K13**	0-100℃	**K14**	0-300℃
J	**J01**	0-200℃	**J02**	0-400℃	**J03**	0-600℃
	J04	0-800℃	**J05**	0-1000℃	**J06**	0-1200℃
R *1	**R01**	0-1600℃	**R02**	0-1769℃	**R04**	0-1350℃
S *1	**S01**	0-1600℃	**S02**	0-1769℃		
B *1	**B01**	400-1800℃	**B02**	0-1769℃		
E	**E01**	0-800℃	**E02**	0-1000℃		
N	**N01**	0-1200℃	**N02**	0-1300℃		
T *2	**T01**	0-350℃	**T02**	-199.9-100.0℃	**T03**	-199.9-200.0℃
	T04	-199.9-400.0℃				

RTD

PT100	**D01**	-199.9-649.0℃	**D02**	-199.9-200.0℃	**D03**	-199.9-50.0℃
	D04	-100-100.0℃	**D05**	-100-200.0℃	**D06**	0.0-50.0℃
	D07	0.0-100.0℃	**D08**	0.0-200.0℃	**D09**	0.0-300.0℃
	D10	0.0-500℃				
JPT100	**P01**	-199.9-649.0℃	**P02**	-199.9-200.0℃	**P03**	-199.9-50.0℃
	P04	-100-100.0℃	**P05**	-100-200.0℃	**P06**	0.0-50.0℃
	P07	0.0-100.0℃	**P08**	0.0-200.0℃	**P09**	0.0-300.0℃
	P10	0.0-500℃				

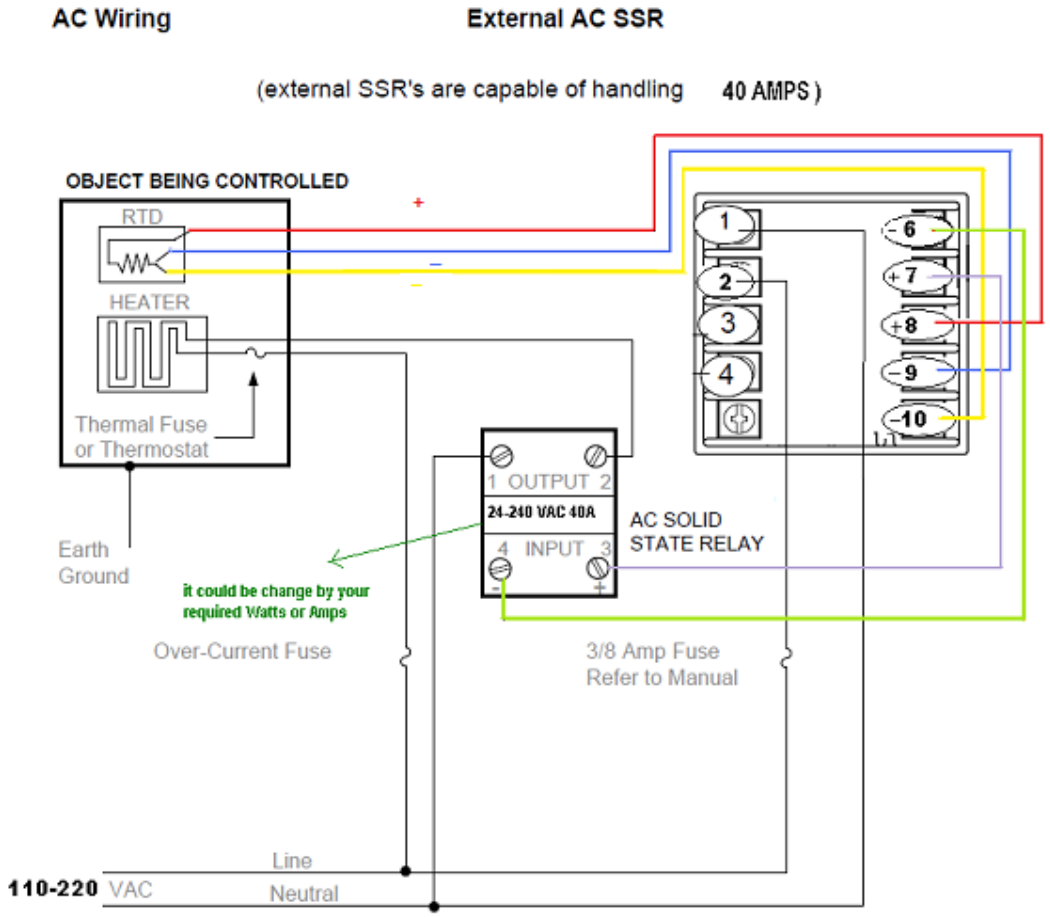
Voltage & Current

0-5V	**401**	0.0-100℃	
1-5V	**601**	0.0-100℃	
0-20mA	**701**	0.0-100℃	*3
4-20mA	**801**	0.0-100℃	*3

About Safety Proceeding	*Before using the product, please read carefully this manual, then use it correctly on the base of understanding its content. *The product can be used to manufacture machinery, work machinery, calculation and measurement instrument(Don’t use it for the medicine machine); *If in the state of interruption or unusual may cause terrible system accident, please set proper protect electrical route outside, in case of the accident.	Attention: Proceeding to the copied ones, there are so many copies of our products in the market, please be careful when you buy it. The company is not responsible for the accident caused by the copies at all.

IX. Wiring Diagrams

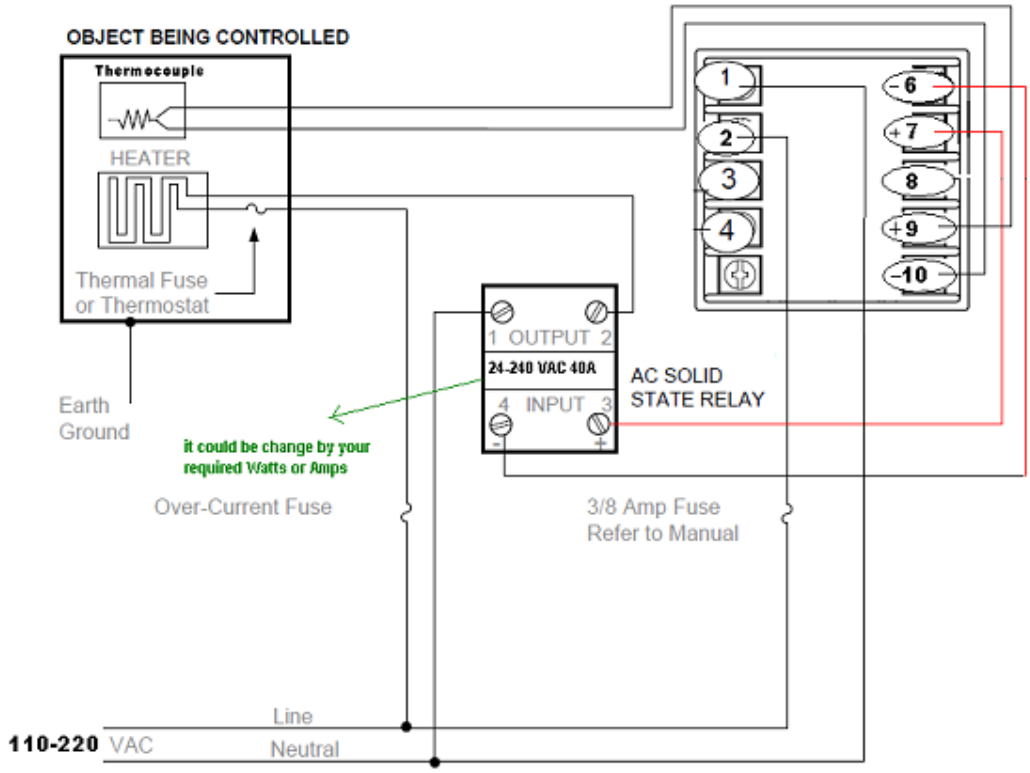
CXTG-3000 - SSR OUTPUT and RTD



CXTG-3000 - SSR OUTPUT and Thermocouple

AC Wiring **External AC SSR**

(external SSR's are capable of handling **40 AMPS**)



CXTG XMTG-3000 PID Temperature Controller Manual

For current product information, availability, and compatible options, use the verified ThermoMart links below. The preceding pages remain the original manual content.

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