KCM- 91WT Temperature Controller Instruction Manual

1. Features:

1.1.Input Sensor Types

Can be connect the following sensors and signals to the universal input.

Thermocouple (temperature input): K, J, T, E, S,R

Resistance thermometer (temperature input): Pt100, CU50

1.2.Control Outputs

A control output can be voltage output (for driving SSR) or Relay contact: 250 V AC, 3 A (Resistive load). depending on the model.

1.3.Adjusting PID Constants

Can be easily set the optimum PID constants by performing AT (auto-tuning) with the limit cycle method.

1.4.Standard Alarms Relay contact: 250 V AC, 3 A (Resistive load).

Can be output an alarm when the deviation, process value, set point, or manipulated value reaches a specified value.

1.5 Sampling Time: 0.5 sec

1.6.Use this controller within the following allowable range:

Allowable ambient temperature: −0 to +55 °C

Allowable ambient humidity: 5 to 85 % RH.

2. Dimensions:

160×80mm panel cutout :152×76mm

96×96mm panel cutout :92×92mm

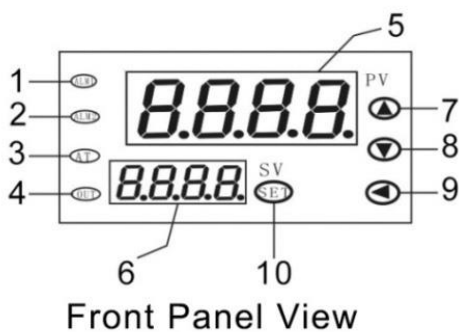96×48mm panel cutout :92×44mm(horizontal)

48×96mm panel cutout :44×92mm(vertical)
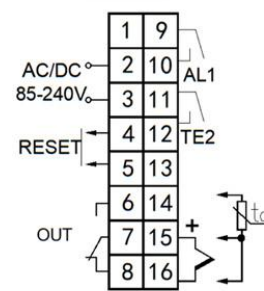
72×72mm panel cutout :68×68mm

48×48mm panel cutout :44×44mm

88×107×59mm DIN 35 rail mounting socket

2. Parts Description:

Front Panel View

Terminal Arrangement

This wiring diagram is offered for example purposes only.

1 ALM1: lamp Lights when Event occurs

2 TE   lamp: Lights when The countdown works.

3 AT lamp: Flashes during Auto-tuning (AT)

4 Output lamp: Lights when output   is turned on

5 PV display: Displays Measured value (PV) or various Parameter symbols

6 SV display: Displays segment level, Set value (SV), Manipulated output value (MV) or various Parameter set values.

7 Up key:

8 Down key:

−Increase numerals.

−Decrease numerals

− To scroll through numbers faster, press and hold the Up key.

9Shift key: Shift digits when settings are changed.

**10 Set (SET) key:** Used for Parameter calling up and set value registration.

3. Parameters

ID	CODE	Name	Setting range	Manual	Defaults
0	SP	Setting value	Determined by P-SL P-SH	Set the temperature set value (SV) which is the target value for control	50.0
1	tE	setting value of the timer	1～99：99	refer to "int" have to shorted "RESET", The countdown will work.	10
2	AL1	Alarm Setting value	Determined by P-SL P-	refer to ALP for the alarm mode suitable.	100
3	P	Proportional Band	0～200.0	Set when PI or PID control is performance. For action. When P=0,the controller is ON/OFF control	8.0
4	I	Calculus time	0～3000S	Eliminates offset occurring in proportional control.	240
5	d	Differential time	0～200S	Prevents overshoot and/or undershoot caused by integral action effect.	30
6	At	Auto tuning	ON: Auto tuning (AT) start OFF: Auto tuning (AT) stopped	Turns OFF automatically when the AT with learning function is completed.	OFF
7	t	Control time	2～120s	Proportional cycle time	20
8	HY	Differential gap	0.1～100.0	When the control is ON/OFF control(P=0) If measured value (PV) is near the set value. the differential gap setting can prevent the relay contact from ON or OFF repetition.	1.0
9	HY1	Alarm Differential gap	0.1～100.0	If measured value (PV) is near the alarm set value. the differential gap setting can prevent the relay contact from ON or OFF repetition.	1.0
10	Pb	PV Bias	±20.0	The value set in the PV bias is added to the correct the input value.	0
11	FILt	Digital Filter	0～50	This is a filter by software prepared in order to measured value (PV) by noise.	20
12	Loct	Set data lock	0～50	LOCK=0, all the parameter can be set. Otherwise, all the parameter can't be set	0
13	Sn	Input type	CU50 (Lu50)、PT100(Pt)、K (t)、E (E)、J (J)、T (t)、S (5)、	CU50、 PT 、K 、 E 、J 、 T 、S	J
14	P_SH	Input range high	P-SL～1800	The control is displayed after the Input type and Input range.	900
15	P_SL	Input range low	-199.9 ～P-SH		0
16	outH	Output limiter high	OUTL～100.0	The min value and max value of output	100.0
17	outL	Output limiter low	0.0～OUTH		0.0
18	ALP	Alarm type	0～1	0: Alarm function OFF; 1: Process high alarm; 2:Process low alarm; 3: Deviation High alarm ; 4: Deviation low alarm;	0

19	tEP	Time unit	0~1	0：Minutes .seconds 1：Hour.minutes	0
20	$CooL$	Hot/Cold	ON/ OFF	Off:reverse control(heating) On:positive control(cooling)	OFF
21	oP_A	Output type	—	SSR：Solid state relay,RLP:Relay	-
22	$oPPO$	Initial output	0~100	Output initial value	0
23	$C\ F$	PV unit	C/F	C: Celsius F: Fahrenheit	C
24	dP	Decimal point	ON/ OFF	ON. decimal point; OFF. no decimal po	OFF
25	Int	Countdown function	0~3	**It will work after being powered on again.**	0

3.2About Countdown function

0	Without timer
1	When the measured value reaches the setting value,the setting time starts to decrease,once the time decreases to the te relay closes and the out relay is working
2	When the measured value reaches the setting value,the setting time starts to decrease,once the time decreases to the te relay closes and the out relay is stopped
3	When the controller is powered on,,the setting time starts to decrease,once the time decreases to zero, the te relay c

4. Operation
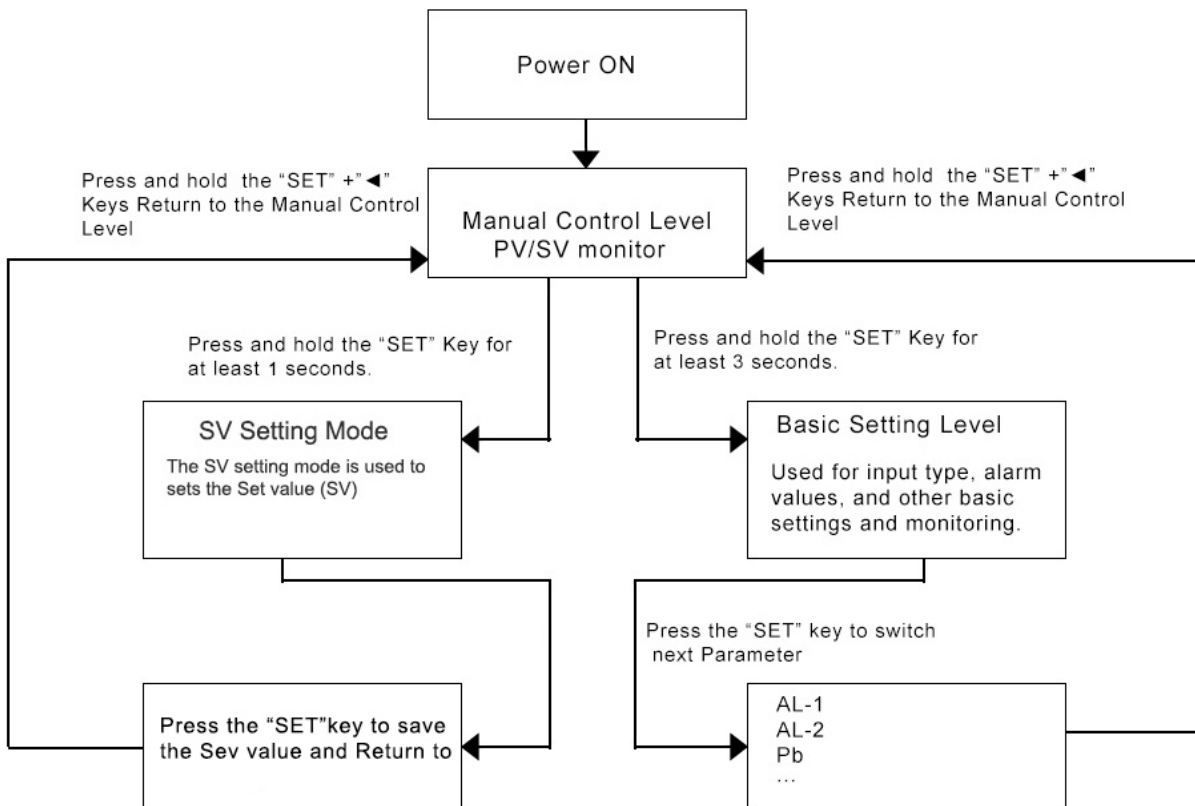
4.1 Basic Setting Level:

Press the key SET 3 seconds to enter into the main Parameters, the controller will display the Parameter code(1~25)in the window at the upper tube, and display the Parameter data at the lower tube. Press Key ▲、▼ or ◄ to adjust the Parameters, and then press the Key SET to preserve.

It will be preserved of the data and withdrawal of the setting with no any operations automatically within 10 seconds.

Electronics Lock. All the Parameter can be revised when Lock=0; Only the "SP" can be revised when Lock=1.

4.2 Setting value Level:

Press the key SET 1 seconds to enter into the SV Setting Mode. When the operation mode is the Auto-tuning mode, the Set value (SV) can be set.

4.3 Manual Control Operation:

Press the ◄ key about 3S enter into the manual regulation, it will display "H" at the lower row, in this time can set the output power; press the ◄ key about 3S again it will withdraw the manual regulation.

5. Determining PID Constants(Auto-tuning)

When AT is executed, the optimum PID constants for the set point at that time are set automatically. A method (called the limit cycle method) for forcibly changing the manipulated variable and finding the characteristics of the control object is employed.

Set the HY is 0.5～1℃, if the output is relay set the t=10S, then set the AT=1, the lamp of AT will be flashed, in this time the controller enter into **Auto-tuning**. now meter's control way is on-off mode, after 3 times vibrating(3 control period) automaticlly save P, I, D parameter, the self-adjusting procession finished.

Operation will be as shown in the following diagram:

Attentions：

-When **Auto-tuning**, the controller should not change the set value.

-When the power off during **Auto-tuning**, it will restart **Auto-tuning** next time.

-When it need artificially exit during **Auto-tuning**, set the Parameter(AT) to 0 so that can exit，but the setting result will not be valid.

6. Alarm (ALM) function：

Alarm (ALM) function	Alarm status[ON]	Alarm status[OFF]
Process high alarm	Measured value>Alarm set value	Measured value<Alarm set value
Process low alarm	Measured value<Alarm set value	Measured value>Alarm set value
Deviation high alarm	Measured value>Alarm set value + Set value	Measured value>Alarm set value + Set value
Deviation low alarm	Measured value<Alarm set value - Set value	Measured value>Alarm set value - Set value

Character Symbols：This manual indicates 9-segment display characters as shown below.

A	B	C	D	E	F	G	H	I	J	K	L	M
A	b	C	d	E	F	G	H	I	J	K	L	m̄
N	O	P	Q	R	S	t	U	Y	T			
n	o	P	q	r	S	t	u	y	r			