Intelligent Small Long Chart Recorder

SUP-R1000

User manual

Thank you for using our product, please read this manual carefully before use it

Catalogue

I. General

The recorder is a precision measuring instrument with perfect definition, high precision, and reliable, multi-functions, ease operated by using unique heat-printing record and advanced technology of microprocessor controlling. It can be recorded and printed uninterrupted.

The every channel of the recorder can select receive a few kinds of thermocouple, resistance, voltage and electric signal directly. The measured signal can be displayed by data and also can be effected trend recording as well as data recording. This meter can record the scale number, time and every signal curve on 100mm width paper, and also can print numbers by every channel track. It can set the kind of signal, position of decimal point, display range, record borderline, alarm scale, round error, correct system error, record ruler, time interval, chart speed and contrast via keyboard operation and also can save all the setting results. The recorder is widely used in medicine, petroleum, chemistry, metallurgy, electric power and research institution.

II. Main functions and technology specifications

1). Input :

1, 2 , 3 , 4 , 5, 6, 8 (dot)   point

The kind of measurement signal of every channel can be set by user or can be set by manufacturer depends on user's requirement.

2)Channel isolate:

Input between channel mutually isolates.

3).Display function:

Hold and scan display of the measuring data

Display the setting parameter (under setting mode)

Display alarm state and relay state.

Time display (under the status of all input signals are closed)

4) Recording function:

Adopted imported heat-sense head in fixing mode, without ink consumed and error occurred and is also vibration resistance.

Consist of 800 heat printing points within 100mm range

Conduct trend record and data record for the measuring result

can print ruler scale and channel mark at the same time of conducting curve recording

Print ruler scale, time and paper speed in every 100mm

5)Clock timer: Year,month,hour,minute,can be set.
Battery backed.

6)Curve moving function:

The tread recording curve of different channels can be separated by setting the record borderline.

7). Kinds of input signal and measurement range:

Thermocouple, resistance, standard voltage and electric signal and be set by keyboard operation.   chart 1

Input		Code	Measurement Range
DC Current	mA	01	0~10mA
	mA	02	4~20mA
	mA sqr	03	4~20mA sqr
DC Voltage	mV	11	0~20mV
	mV	12	0~50mV
	mV	13	0~100mV
	V	14	0~5V
	V	15	1~5V
	V sqr	16	1~5V sqr
RTD	Pt100	21	-50.0~550.0 °C
	Cu100	22	-50.0~150.0 °C
	Cu50	23	-50.0~150.0 °C
Thermocouple	T	31	0.0~400.0 °C
	E	32	0~1000 °C
	K	33	0~1300 °C
	S	34	0~1750 °C
	B	35	500~1800 °C
Close channel		00	

8) Ruler changing function:

Voltage and electric input signal can be displayed and recorded with the lineal mark of input signal by the ways of setting the display range. The signal display range is the same as the measurement range for thermocouple and RTD.

9). Chart speed: can set freely at the range of 10mm/h to 990mm/h by keyboard operation

10). Alarm function:

Up to 6 alarm relay outputs. User can select freely.

Every alarm channel can select high,low,delta high,and delta low.

Alarm hysteresis of every channel can be set, the indicator flash when relay working.

Contact capacity of relay:24VDC,3A; 220VAC,3A

11)Communication: can provide communication connection with RS 232c or RS485 (this item is extended function, please make claim when place order)

12)Output :

Up to 2 current output channels(4 to 20mA)

(this item is extended function, please make claim when place order)

13) **Sampling period:** 600ms

14) **Precision of data display and alarm:** ±0.2%F•S

15) **Precision of tread recording:** ±0.2% (2 pieces)

16) **Precision of data recording:** ±0.2%F•S

17) **Impedance of input:** more than 10MΩ (remark: input impedance is 250Ω when conduct electricity emolument)

18) **Maximum power consumption:** less than 30w

19) **Ambient temperature and humidity:**

Temperature range: 0~50°C   Humidity range: 10~85 % R•H

20. **Power source:**   220 V;   50 Hz

21. **Dimensions:**   144 × 144 × 200 mm

22. **Hole size:** $138^{+1} \times 138^{+1}$ mm

III. Working principle and characters

Every input signal is sent to the single sheet machine by the program of signal enlarge, AD shift with 24 digit distinguish, insulate of light and electricity. It can thoroughly avoid interfere among every input channels, between input channel and CPU. It makes use of digital temperature sensor with high definition to compensate the temperature on the colder side of thermocouple. In order of improve the long term stability, this meter is effected the controlling method by computer software instead of traditional method controlled by potentiometer. Each parameter has been set down well by the manufactory. The user can adjust the system by keyboard operation.
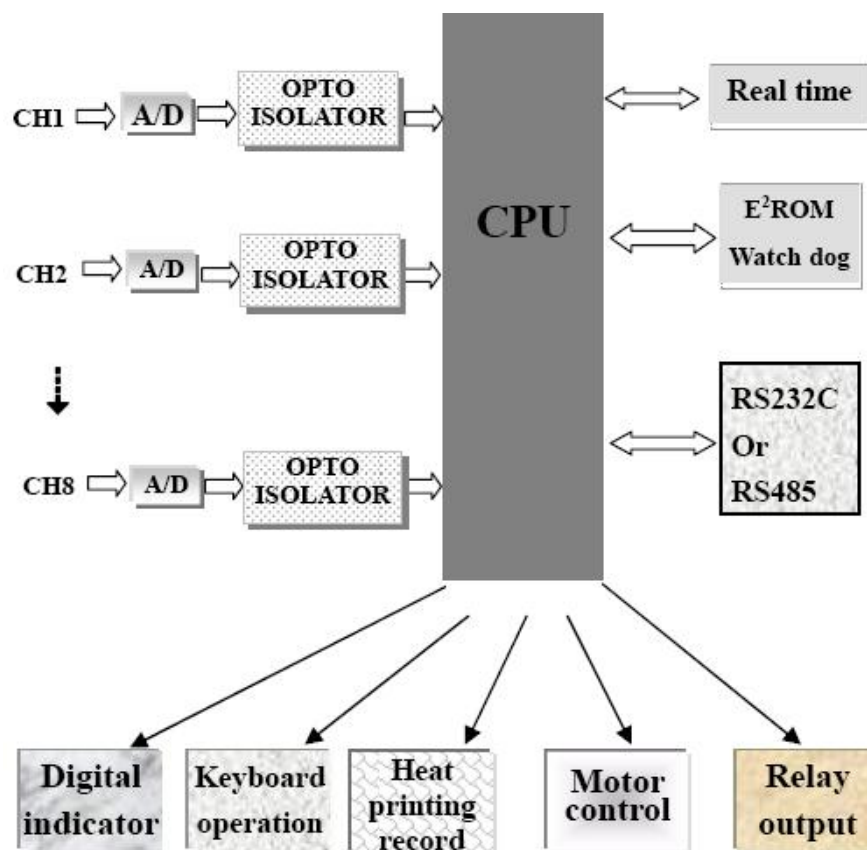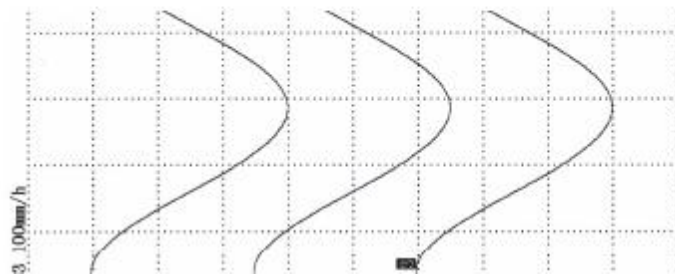
IV. Display and Record
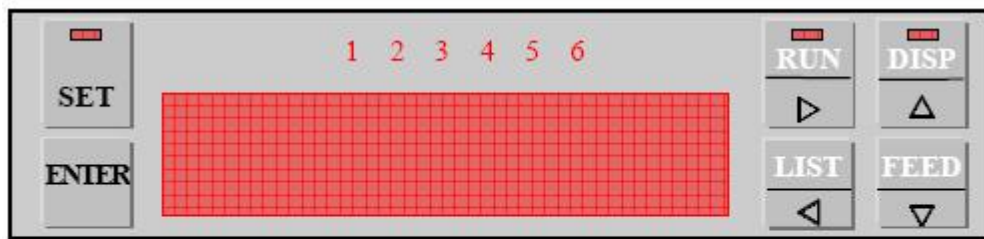
1) Display method:

⇔Under measurement mode, display channel number and measurement data

⇔Under setting mode, display setting content

⇔Display time when all the channels closed

⇔The 6 indicators are served for the relay working

2) Record method:

print record curve (recording indicator is light on under recording model)

print parameter (press [LIST] button when recording indicator is light off)

Label	Symbol	Value
FUNCTION		CHN01
RANGE	R	Pt100
DOT POS	d	1
DSP LOW	L	-50.0
DSP HIGH	T	550.0
REC LOW	L	0.0
REC HIGH	⅂	0.0
ALM HIGH	H	0.0 N
ALM LOW	⅃	0.0 N
ALM DH	H.	0.0 N
ALM DL	⅃.	0.0 N
HYSTERES	E	0.0
ZERO ADJ	⅃	0.0
CHART SP	P	100
SCALE	b	0
INTERVAL	U	0
YEAR	yy	2005
DATE	dd	08-18
TIME	tt	17:30:48
CONTRAST	dR	0

Print measurement data (press [LIST] button, when the record indicator is light on)

| 2005-08-18 | 17:32:10 | 89.2 ℃ |

V. Display content of digital indicator

chart 2

A RANGE				01~35	
d DOT POS					0~3
1~8	**F** DSP LOW	-1~9	[0123456789]		
	H DSP HIGH				
	C REC LOW				
	J REC HIGH				
	H ALM HIGH				
	L ALM LOW				
	H ALM DH	0000~9999			
	L. ALM DL				
	E HYSTERES			00~99	
	J ZERO ADJ	- or +		00~99	
P CHART SP		0010~1990 mm/h			
b SCALE					0~8
U INTERVAL	0000~9999 min				
y YEAR	**y**	2	0	00~98	
d DATE	**d**	01~12		01~31	
t TIME	**t**	00~23		00~59	
d CONTRAST	**A**				0~3

VI. Keyboard operation

The recorder totally has six buttons, include measurment mode and set-up mode, the button is make of high quality material and sounds clear buzzer when press it.

1. Key operation for measuring mode

RUN key: press one time, indicator light on, recorder print simulate curve by the setting result. Press once again, indicator light off, recording is stop, it only display measure data.

DISP key: press one time, hold the current channel. Press once again, scan display the measure data of each channel.

FEED key: press one time, paper move quickly, press again, back to the previous status.

LIST key: a.when recording indicator is light off, press one time, print all the setting data and current time/paper sending speed

b.when recording indication is light on, press one time, print current measurement data and current time/paper sending speed of every channel.

2. Key operation for setting mode

Attention: under setting mode, meter returns to the measuring mode if there is not key operation within 30 seconds.

SET key: press one time lasted 3 seconds and get into set-up mode, indicator light on. press once again, indicator light off and back to the measuring mode.

ENTER Key: under the setting mode, press key after setting each parameter every time, this can input the setting result (current display content) into system and then get into the next setting.

▷ key: under setting mode, press one time, flash indicator move 1 digit location to the right

◁ key: under setting mode, press one time, flash indicator move 1 digit location to the left

△ key: under setting mode, flash indicator display the increased data of the next sign or parameter

▽ key: under setting mode, flash indicator displayed the decreased data of the next sign or parameter

3. Parameter setting method

Under setting mode, user can select chart speed, time interval of printing and contrast by the way of setting the parameter.

1) How to set measure range and close a certain measurement channel?

The recorder has 20 kinds of input signals which can be selected by user by the way of coding. Detailed code of measurement range is as chart 1. the input signals are effected normal measurement, display and record from setting this item. When setting the measurement range, the first step is to confirm the kinds of input signal of the working channel. It can refer to chart 1 to ascertain the code, then input the code into recorder system by keyboard operation. The sign of measurement range is **A** .

when shut off a certain channel, just need to set the code of this channel is 00

e.g. 1: set the measurement range code of no. 1 channel is 4~20mA

detailed operation: at first refer chart 1 to ascertain the code is 02, then press **SET** button last 3 seconds, at this moment, the 1st digital indicator flash and display **I**

press ▷ button, the 2th digital indicator flash, Press △ show A
press ▷ button, the 5th digital indicator flash, Press △ show 0
press ▷ button, the 6th digital indicator flash, Press △ show 2

the screen final display: `1 A    0 2`

Press **ENTER** button, the settings is saved automatically

Continue the following operation or press **SET** button to exit the set up mode.

2)How to set digital position of decimal point?

The sign of digital position of decimal point is d , setting it first before setting the display range. The setting code range is 0 ~3 , means the 0 is matched the 6th digital indicator, 1 matched the 5th digital indicator. 2 matched the 4th digital indicator, 3 matched the 3th digital indicator. We can see from the example 2 that the display range is −100.0~100.0°C. the digital position of decimal point is at the second order from the right, i.e. the 5th digital indicator, the matched code is 1 . so the setting is according to the following operation.

press **SET** button last 3 seconds, at this moment, the 1st digital indicator flash

press ▷ button, the 2th digital indicator flash, Press ∧ show d
press ▷ button, the 6th digital indicator flash, Press △ show 1

the screen final display: `1 d     1`

Press **ENTER** button, the settings is saved automatically

Continue the following operation or press **SET** button to exit the set up mode.

3) How to set the display range?

The display range includes high and low. The code is ⊢ and ⊣ , the low/ high are matched the measurement range respectively. It can display the input signal and shift the scale by the settings of display range.

Attention: if the input signal is electric current or voltage, it need to be set display range and also can set digital position of decimal point.

If the input signal is thermocouple or RTD, it doesn't need to set display range.

e.g. 2: the measurement range of no. 1 channel is 4~20mA, display range is

−100.0~100.0°C。

detailed operation: setting measurement range is refer to chart 1, and continues the following operation

A) setting the lower limit (the left borderline can be known as −100.0°C from the chart 1)

Press △ button, the 2th digital indicator flash and display ⊢
press ▷ button, the 3th digital indicator flash, Press △ show ⊣
press ▷ button, the 4th digital indicator flash, Press △ show 0
press ▷ button, the 5th digital indicator flash, Press △ show 0.
press ▷ button, the 6th digital indicator flash, Press △ show 0

the screen final display: `1ㅏ  ㄱ0 0.0`

Press **ENTER** button, the settings is saved automatically

B) setting the high limit (the right borderline can be known as 100.0°C from the chart 1)

Press △ button, the 2th digital indicator flash and display ㄱ

press ▷ button,the 3th digital indicator flash, Press △ show |

press ▷ button,the 4th digital indicator flash, Press △ show 0

press ▷ button,the 5th digital indicator flash, Press △ show 0.

press ▷ button,the 6th digital indicator flash, Press △ show 0

the screen final display: `1ㄱ  1 0 0.0`

Press **ENTER** button, the settings is saved automatically

Continue the following operation or press **SET** button to exit the set up mode.

4） **How to set record borderline and close the record of a certainmeasurement channel ?**

Record borderline includes low and high, the code is ⊏ and ⊐ , the low and high is matched the 0 to 100% scale of recording paper. The curve of input signal can be recorded timely by the way of setting record borderline. It also can make the curve transfer as well as avoiding the interfere among the important curves.

If close a certain channel, set the left borderline is as same as the right borderline.

e.g. 2: the measurement range of no. 1 channel is 4~20mA, display range is −100.0~100.0°C, record range is 0.0—150.0°C。

detailed operation: setting measurement range is refer to chart 1, setting display range is refer to chart 2, and continues the following operation

A)setting the left borderline

Press △ button, the 2th digital indicator flash and display ⊏

press ▷ button,the 3th digital indicator flash, Press △ show 0

press ▷ button,the 4th digital indicator flash, Press △ show 0

press ▷ button,the 5th digital indicator flash, Press △ show 0.

press ▷ button,the 6th digital indicator flash, Press △ show 0

the screen final display: `1⊏  0 0 0.0`

Press **ENTER** button, the settings is saved automatically

B)setting the right borderline

Press △ button, the 2th digital indicator flash and display ⊐

press ▷ button,the 3th digital indicator flash, Press △ show |

press ▷ button,the 4th digital indicator flash, Press △ show 5

press ▷ button,the 5th digital indicator flash, Press △ show 0.

press ▷ button,the 6th digital indicator flash, Press △ show 0

the screen final display: `1 J    1 5 0.0`

Press **ENTER** button, the settings is saved automatically

Continue the following operation or press **SET** button to exit the set up mode.

5） **How to set alarm and relay output?**

The recorder can be set 2 levels alarm. The 1 level is the high and low, the code is **H** &**L** , the 2 level is delta high and delta low, the code is **H** &**L.** . totally 6 relays can be used freely.

The delta high is the data over the high, the actual alarm =high + delta high

Example: high is 115°C, delta high is 4.0°C, the actual alarm=115+5=119°C

The delta low is the data down the low, the actual alarm =low – delta low

e.g.4: the measurement range of no. 1 channel is 4～20mA, display range is −100.0～100.0°C，record range is 0.0～150.0°C。 alarm high is 115°C, no. 1 relay output. Low is 90.0°C, no. 3 relay output. delta high is 4.0°C, no. 2 relay output. Delta low is 30.0°C, no. 4 relay output.

detailed operation: setting measurement range is refer to chart 1, setting display range is refer to chart 2, setting record range is refer to chart 3, and continues the following operation

A) set the high

Press △ button, the 2th digital indicator flash and display**H**

press ▷ button, the 3th digital indicator flash, Press △ show **1**

press ▷ button, the 4th digital indicator flash, Press △ show **1**

press ▷ button, the 5th digital indicator flash, Press show **5.**

press ▷ button, the 6th digital indicator flash, Press △ show **0**

press ▷ button, the relay (up the digital indicator) indicator flash.

press △ button, the no. 1 relay indicator flash

❶

the screen final display: `1 H    1 1 5.0`

Press **ENTER** button, the settings is saved automatically

B) set the low

Press △ button, the 2th digital indicator flash and display**L**

press ▷ button, the 3th digital indicator flash, Press △ show **0**

press ▷ button, the 4th digital indicator flash, Press △ show **9**

press ▷ button, the 5th digital indicator flash, Press show **0.**

press ▷ button, the 6th digital indicator flash, Press △ show **0**

press ▷ button, the relay (up the digital indicator) indicator flash.

press △ button, the no. 3 relay indicator flash

❸

the screen final display: `1 L    0 9 0.0`

Press **ENTER** button, the settings is saved automatically

C) set the delta high

Press △ button, the 2th digital indicator flash and display**H**

press ▷ button, the 3th digital indicator flash, Press △ show **0**

press ▷ button,the 4ᵗʰdigital indicator flash, Press △ show 0
press ▷ button,the 5ᵗʰdigital indicator flash, Press △ show 4.
press ▷ button,the 6ᵗʰdigital indicator flash, Press △ show 0
press ▷ button,the relay (up the digital indicator) indicator flash.
press △ button,the no.2 relay indicator flash

❷

the screen final display: |1 H. 004.0|
Press **ENTER** button, the settings is saved automatically

D) set the delta low
Press △ button, the 2ᵗʰ digital indicator flash and displayL.
press ▷ button,the 3ᵗʰdigital indicator flash, Press △ show 0
press ▷ button,the 4ᵗʰdigital indicator flash, Press △ show 3
press ▷ button,the 5ᵗʰdigital indicator flash, Press show 0.
press ▷ button,the 6ᵗʰdigital indicator flash, Press △ show 0
press ▷ button,the relay (up the digital indicator) indicator flash.
press △ button,the no. 4 relay indicator flash

❹

the screen final display: |1 L. 030.0|
Press **ENTER** button, the settings is saved automatically
Continue the following operation or press **SET** button to exit the set up mode.

6) How to set hysteresix?

The contact of the limit-alarming-relay is used to be connected with the controlling electric appliance(such as electromagnetic value) to form the controlling system. In order to avoid dithering of the relay contact when it near the alarming limit, the recorder adopt the way of setting error, the code is E detailed operation: the relay immediate close when the measurement data is get to the alarming limit. The alarming doesn't cancel immediately when measurement is back to the alarm limit. The alarming is canceled when it back to the data that lowers than the alarm limit, and the relay contact turn on.

e.g.5: error is set 4.0°C, upper limit set 115.0°C

When the measurement result is get to 115°C, the relay alarm immediately. When the measurement result is back to 114,.9°C alarm doesn't cancel. When the measurement result is less than 111。0°C, the alarm cancels.

Press △ button, the 2ᵗʰ digital indicator flash and display E
press ▷ button,the 3ᵗʰdigital indicator flash, Press △ show 0
press ▷ button,the 4ᵗʰdigital indicator flash, Press △ show 0

press button,the 5ᵗʰdigital indicator flash, Press show 4.
press ▷ button,the 6ᵗʰdigital indicator flash, Press △ show 0

the screen final display: |1 E 004.0|
Press **ENTER** button, the settings is saved automatically
Continue the following operation or press **SET** button to exit the set up mode.
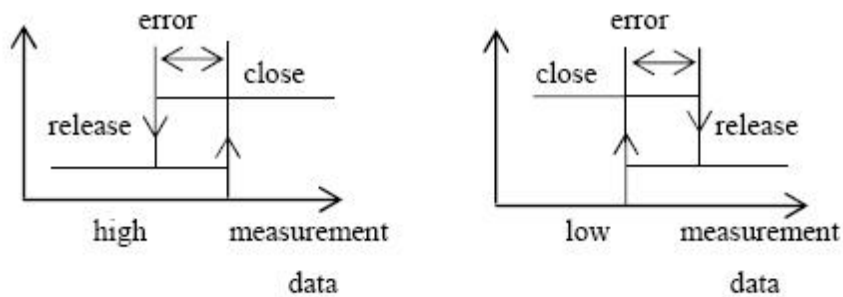
7)Correct method of system error:

Measuring the temperature error by resistor at some temperature points of a certain channel, and then write down the error average. The regulation of error data is: positive error is more than average, negative error is less than average. Adjusting range of error is: -9.9°C ～9.9°C, the code is ⌐

e.g.6: suppose to correct error to no. 1 channel, error is 1.5°C or -1.5°C

press ▷ button, the 2ᵗʰ digital indicator flash, press △ button several times, display ⌐

press ▷ △ button to set the last 4 digital indicators is the error average

error is +1.5°C, the settings display: | ⌐ – 0 l5

error is -1.5°C, the settings display: | ⌐ 0 0 l5

Press ENTER button, the error average is saved automatically and to correct error at the same time.

Continue the following operation or press SET button to exit the set up mode.

8）How to set the chart speed?

the sign of paper speed is P, the paper speed is at the range of l 0 ～ l 9 9 0 mm/h. user only needs to input the data that matched the paper speed.(the first figure is always zero)

e.g. 7: chart speed is set at 60mm/h

Detailed operation:

press SET button last 3 seconds, get into the setting mode

at this moment, the 1ˢᵗ digital indicator flash and display P

Press ▷ button, the 4ᵗʰ digit indicator flash, Press △ show 0
Press ▷ button, the 5ᵗʰ digit indicator flash, Press △ show 6
Press ▷ button, the 6ᵗʰ digit indicator flash, Press △ show 0

the screen final display: P 0 6 0

Press ENTER button, the settings is saved automatically

Continue the following operation or press SET button to exit the set up mode.

9) How to set record scale?

The code of record scale is b, the number can be set 0 ～8, 0 is the scale with 0～100, l ～8 is the scale that matched the recording borderline of channels. Recording scale is printed on paper in every 100mm length.

Example: the recording borderline of no. 1 channel is 0~150, no. 2 channel is -50~50,

When the scale set 1 , display **b   1**

Means the scale ofrecorder is based on the borderline 0~150 scale of no.1 channel

When the scale set 2 , display **b   2**

Means the scale ofrecorder is based on the borderline -50~50 of no.2 channel Others like above setting.

10 How to set interval of automatic printing ?

The sign of time interval of automatic printing measuring result is U . The meter includes 3 kinds of recording ways.   curve recording, data recording/ curve & data recording

A) **Curve recording:** the paper sending speed set from 1 0 ~ 1 9 9 0 . The interval for data printing set at 0 0 0 0 , then the meter will conduct the curve recording according to the users setting.

B) **Data recording:** set the paper sending speed at 0 0 0 , data printing interval set at the range from 0 0 0 1 ~ 9 9 9 9 . Then the meter will record the data according to the printing interval set by the user

C) **Curve & data recording:** set the paper sending speed at the range from 1 0 ~ 1 9 9 0 . Data printing interval set at the range from 0 0 0 1 ~ 9 9 9 9 . The meter will conduct the data & curve recording according to the paper sending speed &data printing interval set by users.

e.g. 8: To conduct the curve & data recording, the data printing interval set at 2 hours.

Detailed operation: convert the data printing interval 2 hours to 120minutes.

Press **SET** button for 3 seconds and get into set up mode, the 1st digit indicator flash

Press △ button, the 1st digit indicator show U

Press ▷ button, the 4th digit indicator flash, Press △ show 1

Press ▷ button, the 5th digit indicator flash, Press △ show 2

Press ▷ button, the 6th digit indicator flash, Press △ show 0

the screen final display: **U   1 2 0**

Press **ENTER**   the settings will be saved automatically.   Continue the following operation or press **SET** button to exit the set up mode.

11)How to set date and time?

The code of date and time is 9 9 ; d d and E E , that shows year,month, date, hour and minute respectively. It can be printed current date and time on recording paper in every 100mm length and also can memory time without power. This function can not only provide accurate/current date and time to user, but also provide reliable evidence for malfunction analyses.

e.g.9: Date is feb 21, 2002 and time 10:49

detailed operation: press [SET] button last 3 seconds, at this moment, the 1st digital indicator flash

press [△] button. The 1st & 2nd digital indicator flash Ⴁ Ⴁ , (ignore 3rd and 4th digital indicatior)

press [▷] button, the 5th digital indicator flash, Press [△] show **0**

press [▷] button, the 6th digital indicator flash, Press [△] show **2**

press [ENTER] button, the 3rd and 4th digital indicator switch to **2 0** automatically

the screen final display: **ⴁ ⴁ 2002**

the settings is saved automatically.

The 1st and 2nd digital indicator flash after above operations.

press [△] button, display **d d**

press [▷] button, the 3rd digital indicator flash, Press [△] show **0**

press [▷] button, the 4th digital indicator flash, Press [△] show **2**

press [▷] button, the 5th digital indicator flash, Press [△] show **2**

press [▷][▷] button, the 6th digital indicator flash, Press [△] show **1**

the screen final display: **d d 0221**

Press **ENTER** button, the settings is saved automatically.

The 1st and 2nd digital indicator flash after above operations.

press [△] button, display **t t**

press [▷] button, the 3rd digital indicator flash, Press [△] show **1**

press [▷] button, the 4th digital indicator flash, Press [△] show **0**

press [▷] button, the 5th digital indicator flash, Press [△] show **4**

press [▷][▷] button, the 6th digital indicator flash, Press [△] show **9**

the screen final display: **t t 1049**

Press **ENTER** button, the settings is saved automatically.

Continue the following operation or press [SET] button to exit the set up mode.

12) How to set printing contrast?

Adjustment could be made on the recorder to get the high quality printing. code **0** ~ **3** . the bigger code, the darker the printing is.   indicator : **d A**

e.g.10 set the printing direction code as 2 (print in reverse direction)

Press [SET] button for 3 seconds and get into the set-up mode, the 1st digit indicator flash

Press [△] , the 1st and 2nd digit indicator show **d A**

Press [▷] , the 6th digit indicator flash, Press [△] show **2**

the screen final display: **d A   2**

press [ENTER] button, the settings will be saved automatically. to continue the following operation or press [SET] button to exit set-up mode.

VII. The structure and installation

1. Characteristics of the constructure:

The equipment consists of the cover and the consist paper folding device , paper sending reductor and the heat print device. for the convenience for changing the record paper, the paper fold device is designed in the mode that can be poped-up automatically.The set up button locate at the both left and right side of the display screen.　During the operation, it is unnecessary to take out the paper folding device. The meter is adopted galvanized material and digital control technology make the meter more reliable.
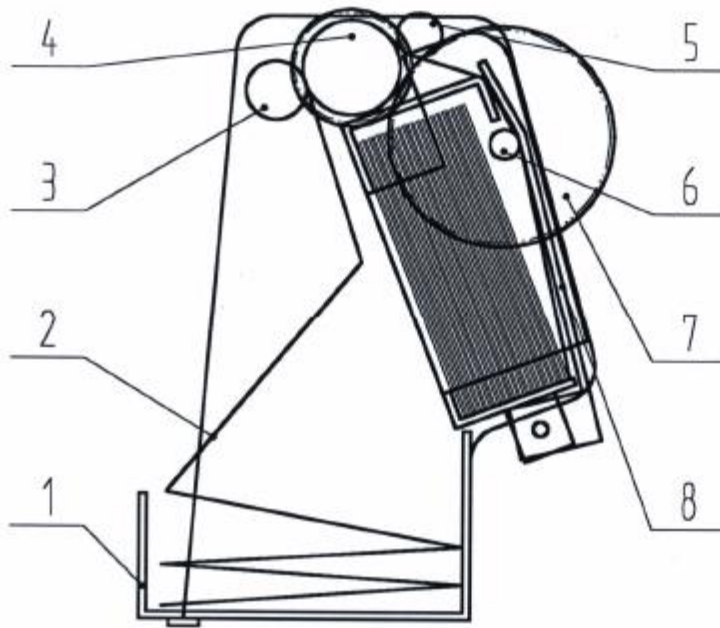
1. paper folding rack   2. record paper   3. roller   4.   rubber roller
5. paper guider   6. paper guider   7. gear wear 8.   paper fixer

fig.2

2. Installation method

The detailed installation method is as following,

1) Place the meter into the dial plate' socket gently; make it close tightly with the dial plate.
2) From the backside of dial plate, fix the meter's two installation racks into the two sets of sockets (connecting holes) on the cover.
3) Using the proper screw driver,　screw the long screw pole fixed tightly on the installation racks, then the equipment could be fixed
4) If the equipment needed to be dismantled for maintenance, the screw needed to be turned reversely then the meter can be take out

3. method of   changing paper (see fig.2)

a.   Take out the paper folding device; put it steadily on the table.

*folding device bumped is forbidden.

b. Put the 8 move to outside and put into some new paper.

c. Pull out some paper from one side and round 6, insult the space between 5 & 6, and turn 4 to make the paper out, put the paper surround on 4 symmetrically. *the heat printing side of paper should be up.

d. Put the outside paper insult the space between 4 & 3.
    *the folding line of paper is better parallel with the axes line of the 4

e. Move 7 make the paper guide downwards symmetrically and then paper fold maturely.
    *the paper folding direction must be the same with previously.

f. When the paper used up, put the paper out.

g. The procedure of changing recording paper every time is same as before.   * means pay attention!

h. When finish changing paper, if the folding device can be put into the correct position in the core, push is slowly when press the paper sending button. Don't move toughly to avoid destroy gear.

VIII. Maintenance

- It should be kept in the environment which temperature ranged from 0~50 °C

- The environment contains corrosion gas is not acceptable

- Less daily maintenance required.   Normally, it is only required to keep the heat printing head clean.

- Sometimes the dust could stick on the heat printing head and affect the printing quality.   When it occurs, the heat printing head need to be cleaned.

- Cleaning method: take out the paper folding device, by using the soft cloth or cotton dipped with alcohol, clean   the heat printing point gently from   angle .

Backward wire connection chart
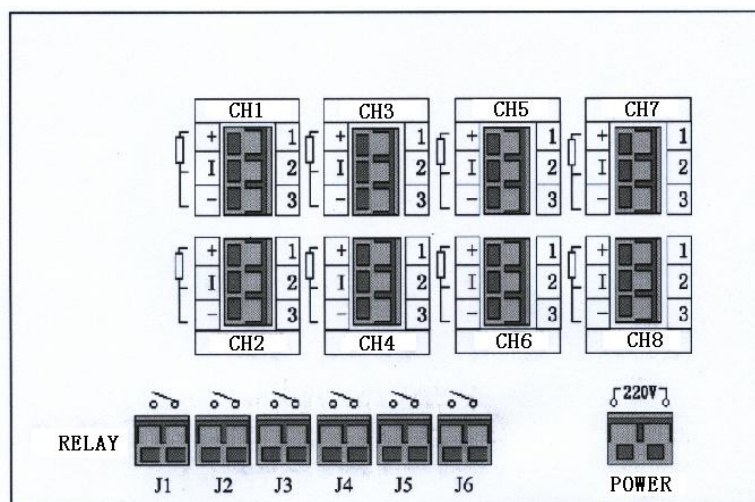
IX. Wire connection method

refer to "backward wire connection chart", explanations as follows,

❶measuring signal of trinomial heat resistance, connect 1 2 3, the 1 is common point. (avoid the interfere of wire resistance automatically)

❷measuring signal of binomial heat resistance, connect 1 3. (avoid the interfere of wire resistance by the way of correcting error)

❸measuring signal of electric current, connect 2 3, 2 connect anode, 3 connect cathode

❹measuring signal of voltage and thermocouple, connect 1 3, 1 connect anode, 3 connect cathode.

❺the output point of relay is usually turn off.

❻without special indication, the 220V should be used.

X. Guarantee and the items for attention

◇Recorder can record several channels at the same time, can close the channels that is unused.

◇The valid working power ranged from: 220V +10%, to 220V -15%

◇Under the normal situation, the guaranty is valid for one year.