

# KH400G Paperless Recorder



High Quality Color Paperless Recorder



# Memory Flash Drive Data Saving

**Provides flexibility and variety in the handling of record data**



## Time Display

Indicate date and time of recorded data

## Trend Display

Allow you to view data in trend forms

## Digital Display

Allow you to view data in digital form

## Alarm State

Alarm state display: HH,LL,H,L when alarm

## Key Panel

Allows you to perform selection of display, setting, data change, and channel no. change

## USB Port

Allows you to download data from recorder to PC by USB flash drive

## Long Time Memory

8MB capacitor built in for long time memory. At least can record 1 day data, 440 years data at most

## Universal Input, 48 Points Max. Recording

Photoelectrical isolated universal input, 10 types of thermocouples, 3 types of resistance bulb, DC voltage, DC current, mV, 0-5Hz frequency input are available.

## USB Download Data Directly

Saved data transferred by USB flash drive directly, plug and play, easy to operation

## Math, Flow Totalizer Option

Math: addition: +, subtraction: -; multiplication: \*; division: /; average; Max.; Min.

## Screensaver

Recorder turns off the backlight of LCD and exit parameter setting screen when non-operation.

## Communication

Photoelectrical isolated RS485 serial communication is available. Standard MODBUS-RTU protocol with reading and writing functions.

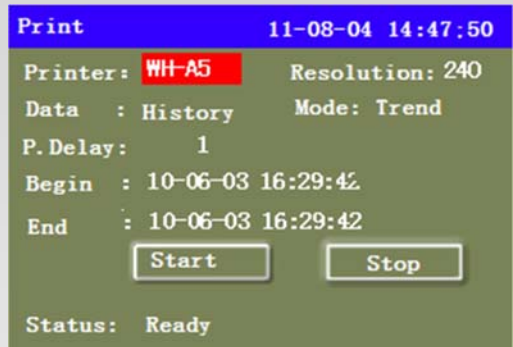
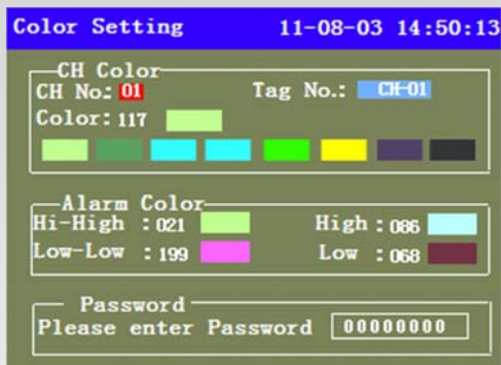
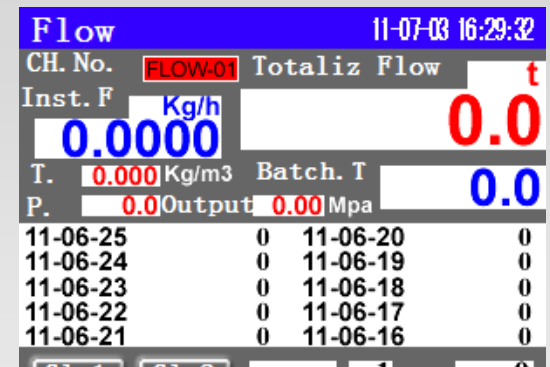
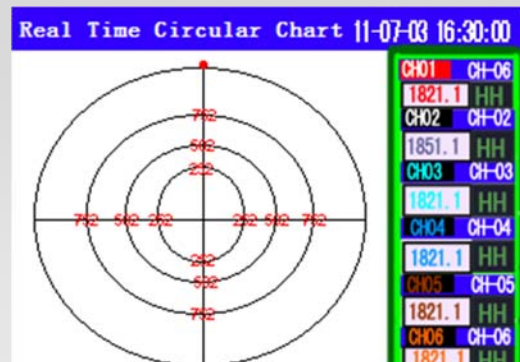
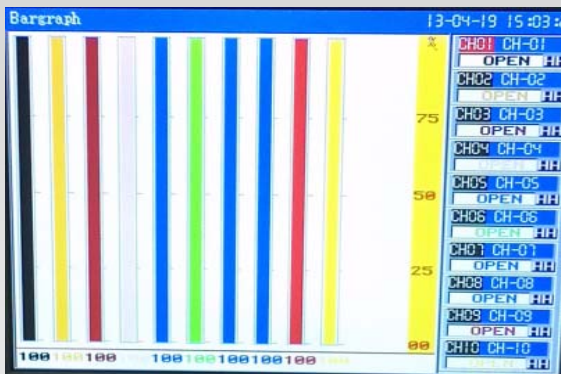
## Printing

Curve or digital data can be printed by connecting mini printer directly or through software

## PC Support Software

Display data in digit and trend format, Export data as Excel format for further analysis, Print trend data by

## Various Screen Display Modes



## Specifications

General Specification		Life of Backlight	50,000hours
Power Supply	100-240VAC, 47-63Hz;	Screensaver Time	0-30000s, settable
Power Consumption	Maximum 25VA	Unit	77 , settable and addable each channel
Insulation	Power to ground > 1500VAC Power to housing > 1500VAC	Display Contents	<ul style="list-style-type: none"><li>Real time Trend Display</li></ul> In horizontal, selected in the refreshment cycles of 1 to 3600sec Scale display <ul style="list-style-type: none"><li>Real time Circular Chart Display</li><li>Digital display</li></ul> Single and multi channels display <ul style="list-style-type: none"><li>Bargraph Display</li><li>History Trend Display</li><li>History Circular Chart Display</li><li>Printing Setting Display</li><li>System Configuration</li></ul>
Keyboard	P/E, Left, Right, UP, Down		
Materials	ABS for case and bezel		
Terminal	M5 screw terminal		
CPU	32bits, high performance and integrated ARM		
Mount Method	Panel Flush Mounted		
Size/Mount Size/Mass	287x287x175,280.5x280.5mm/4kg		
Operation Temperature	Working Temperature:0-50C Relative humidity; 10%-85%( now dew)		
Transport /Storage	Temperature: -20-60℃ Relative humidity : 5%-95%(nodew)		
Input Specification		Recording Specification	
Number of inputs	1, 2, 3, 4,5,6....48 points	Memory Media	USB memory , FAT16 format
Input Signal	Thermocouple: 10 types (K,S,B,E,J,N,R,T,WRe526,WRe325) RTD-Resistance bulbs: 3 types (Pt100, CU50,CU100) Linear DC Voltage: (0-5VDC, 1-5VDC,0-10VDC) DC Current: (4-20mA, 0-10 mA) mV:0-20mV,0-60mV, 0-100mV, 0-500mV Frequency: 0-5KHZ, 3 Channel	Memory	Flash memory
		Memory Capacity	8MB built in for long time record
		Record Interval	1 to 3600 seconds, settable flexibly
		Record Time	Record time =45daysx record interval÷ channel numbers . Can record 1 day data at least, also for 440 years at most
		Recording Method	Start recording when power on. Stop recording when power off.
		Data Save Cycle	Oldest data replaced by newest data accordingly when memory is full
		Optional Output Function	
Sample Rate	<1second	Relay Alarm	up to 48 points, 220VAC/30VDC/3A, NO+NC
Scaling	-20000 to 20000	Retransmission	4-20mA, up to 12 point build-in
CMR Ratio	85-110dB	Print	RS232 print port
Temperature Shift	50PPM	USB	USB flash drive
Photoelectrical Isolation	1000VAC between channels ground 400VAC between channels	Auxiliary Power Supply	24VDC, max.40mA for sensor and transmitters, up to 8 points built in
Input Independence	0-5VDC and 1-5VDC input: 500KΩ 4-20mA input: 250 Ω 0-10mA input: 500Ω Other signal input :20MΩ	Communication	RS485,RS232 serial port, standard MODBUS-RTU Protocol
Input Error Action	Max, Min, Hold	Alarm Function	
Display Specification		Type of Alarm	High, Low, High-High, Low-Low limit
Display	10 inch, 320X240 TFT, Color LCD display	No. of Setting	Up to 4 alarms are settable for each channel ,configurable flexibly

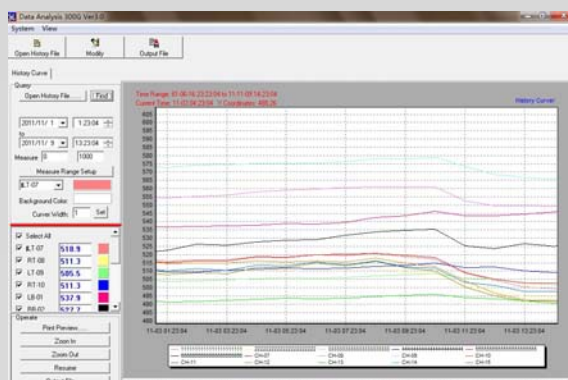


## Specification

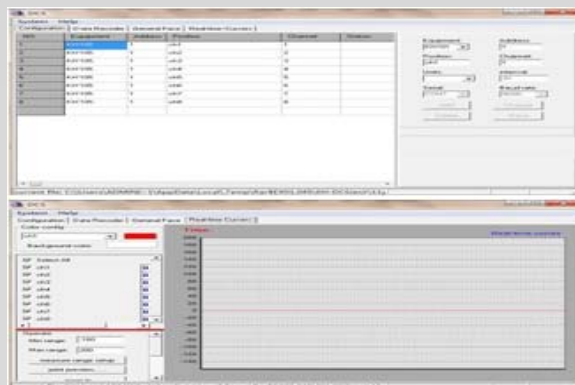
<b>Alarm Indication</b>	Alarm States is displayed in digital, trend, bargraph, circular chart. When alarm occurs, state flashing	<b>Clock</b>	Clock accuracy: $\pm 5$ ppm. After power off, Li battery for continual power supply. The validity of battery is 30days.
<b>Alarm output</b>	Up to 48 points, 3A contact	<b>PC Support Software (Standard-supplied CD-ROM)</b>	
<b>Alarm Setting</b>	Individual or common output	<b>O/S</b>	Window 2000/XP, VISTA
<b>Communication Function</b>		<b>Required Hard Disk Capacity</b>	Free capacity of 30MB or larger required
<b>Communication</b>	Photoelectrical isolated RS485 , RS232communication port, read and write data and parameter	<b>Required Memory</b>	1GB or larger
<b>Protocol</b>	Standard Modbus RTU, can communicate with	<b>Contents</b>	The follows types are included as standard: 1) Data Analysis Software <ul style="list-style-type: none"> <li>It allows you to view the past recorded data in digit and curve format from data saved in recorder to USB flash drive</li> <li>It allows you to export the data as Excel format for further analysis</li> <li>It allows you to print the curve data by office printer</li> </ul> 2) DCS configuration Software <ul style="list-style-type: none"> <li>It allows you to view real time data in digit, curve format</li> <li>It can save the past data with same function with data analysis software.</li> </ul>
<b>Cable</b>	RS485 shielded twisted pair cable		
<b>Print Function</b>			
<b>Print Port</b>	RS232C comm. Port, Baudrate: 9600		
<b>Printer</b>	Dot-matrix mini printer; Ribbon Resolution: 60,120,240dots/line		
<b>Data Printed Type</b>	History data, Real time data , history curve data, optional		
<b>Reference Performance</b>			
<b>Accuracy</b>	<ul style="list-style-type: none"> <li>0.2 grade when RTD, linear voltage, linear current and T.C input</li> <li>0.2%FS<math>\pm 2.0^{\circ}\text{C}</math> when T.C input with cold junction compensation by internal part of recorder</li> </ul>		
<b>Indication Resolution</b>	0.1 $^{\circ}\text{C}$		
<b>Input Resistance</b>	RTD: Current 2.5mA, three wire, max.10ohm per each wire. Thermocouple: not more than 1000 $\Omega$ .		

## PC Support Software

History Data Transferred to USB flash drive can be viewed  
To personal computer (Data analysis software)



History and real time data by RS485 /RS232 can be  
viewed to personal computer (DCS software)



## PC Support Software

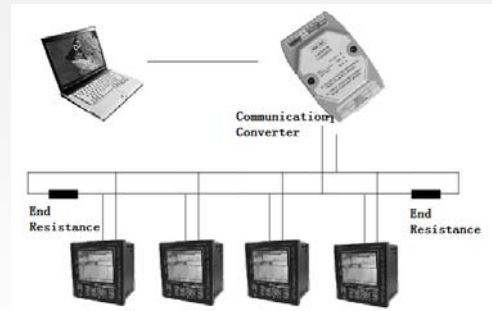
### USB Download Data, Plug and Play



Please install the software in CD and USB flash drive to PC before usage.

- O/S: Window 2000/XP, VSTA
- Required hard disk capacity :Free capacity of 30MB or larger required
- Software functions:
  - .reading recording data and display the data in digital and curve type
  - .Printing the curve data in software through office printer
  - .Export the data as Excel format for further analysis.

### Serial port communication, Standard MODBUS-RTU

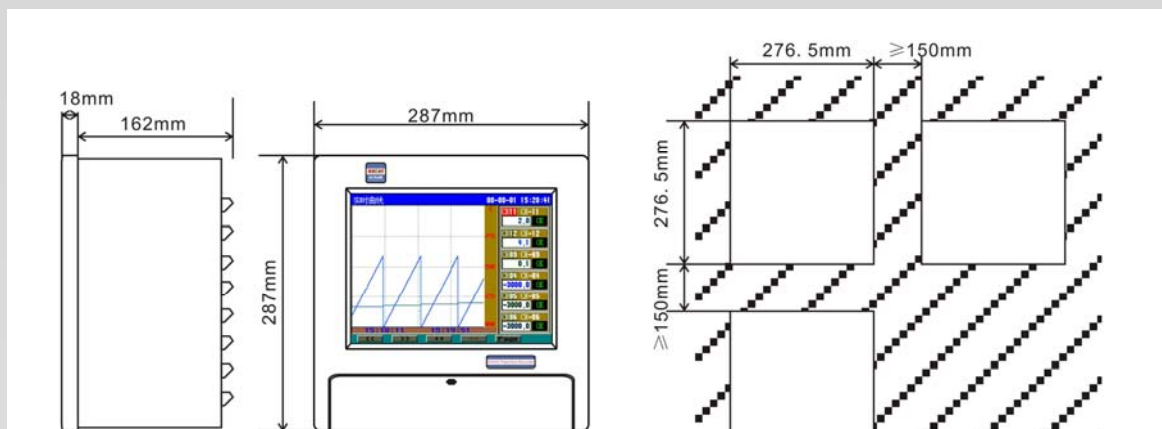


Please install the software in CD before usage.

- O/S: Window 2000/XP, VSTA
- Required hard disk capacity :Free capacity of 30MB or larger required
- Repeater is needed when more than 100m communication distance.
- Software functions:
  - .Real time reading and monitoring the data digital and curve type in PC.
  - .Meanwhile, recording the recording data automatically, whose data also can be exported as Excel format for further analysis.

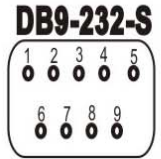
## Size & Installation (Unit: mm)

### Dimension



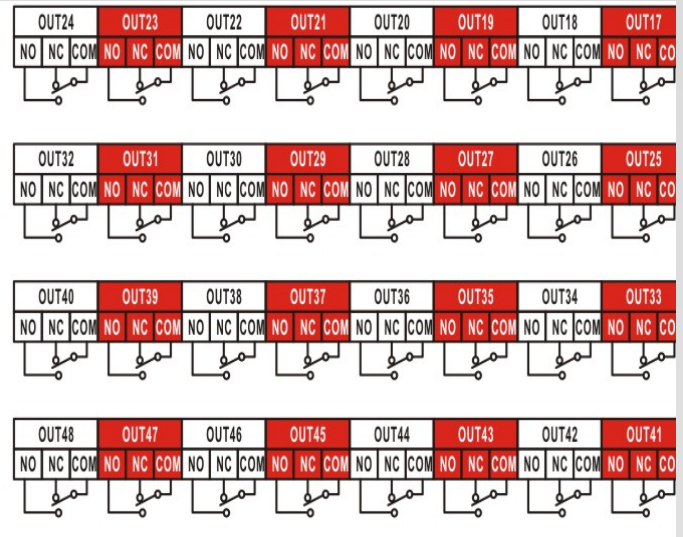
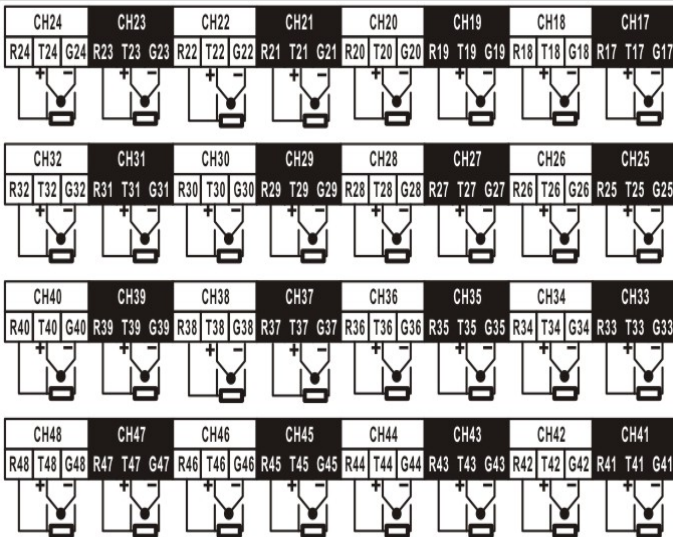
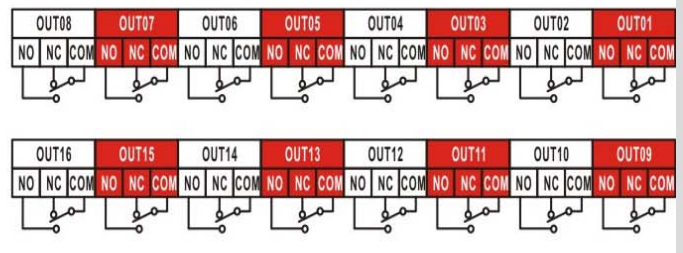
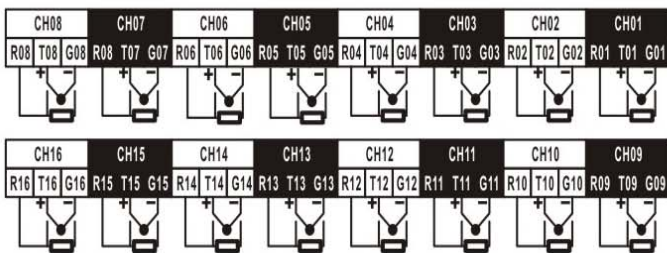
# Diagram & Connection

I-01	I-02	I-03	I-04	I-05	I-06	F-1	F-2		
+	-	+	-	+	-	12V	+	-	12VG

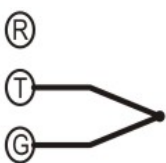


I-07	I-08	I-09	I-10	I-11	I-12	F-3	S-1		
+	-	+	-	+	-	12V	+	-	12VG

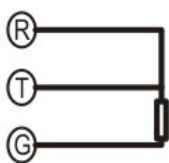
U01-24V	U02-24V	U03-24V	U04-24V	U05-24V	U06-24V	U07-24V	U08-24V	Rs232-P	Rs485	Rs232-S
+	-	+	-	+	-	+	-	TXD	RXD	GND



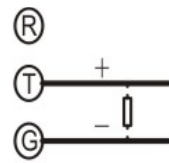
**T.C. Input**



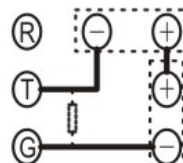
**RTD Input**



**Linear Analog Input**

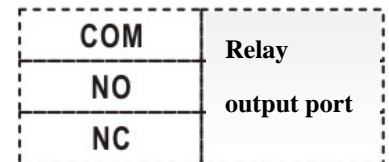


**U3: 24VDC**



**Two wire Transmitter**

Linear analog input: 4-20mA, 0-10mA, 0-5VDC, 1-5VDC, 0-10VDC; 250ohm resistor for 4-20mA, 500ohm for 0-10mA



**DB9-232-S**

PIN	Rs232-S
2	TXD
3	RXD
5	GND

## Order Code

Function	Code and Description													
KH4								U-				KH400G Paperless Recorder		
Channel No.	01											One Channel		
	02											Two Channels		
	...											.....		
	48											Forty-weight Channels		
LCD Color	GG-											Color TFT display		
Relay Alarm Output			N-									None		
			1-									1 alarm: NO+NC , 30VDC/3A, 220VAC/3A		
			2-									2 alarm: NO+NC ,30VDC/3A, 220VAC/3A		
			....									.....		
			48-									48 alarm: NO+NC ,30VDC/3A, 220VAC/3A		
Retransmission Output				N-								None		
				T-									1 channel isolated programmable linear retransmission output: 4-20mA	
				2T-									2 channels isolated programmable linear retransmission output: 4-20mA	
				.....									.....	
				12T-									12 channels isolated programmable linear retransmission output: 4-20mA	
Auxiliary Power Supply for transmitter and sensor					N-							None		
					U3-									1 Isolated auxiliary 24vdc power supply output for transmitter, sensor and other device, max.40mA
					2U3 -									2 Isolated auxiliary 24vdc power supply output for transmitter, sensor and other device, max.40mA
					.....									.....
					8U3 -									8 isolated auxiliary 24vdc power supply output for transmitter, sensor and other device, max.40mA
Communication							N-					None		
							S1-						RS485 communication. Port, MODBUS-RTU	
							S2-						RS232communication. Port, MODBUS-RTU	
Printing								N-					USB flash drive for download data	
								P-						RS232 printing port for mini printer, WH-E20 mini printer as default. Please advise



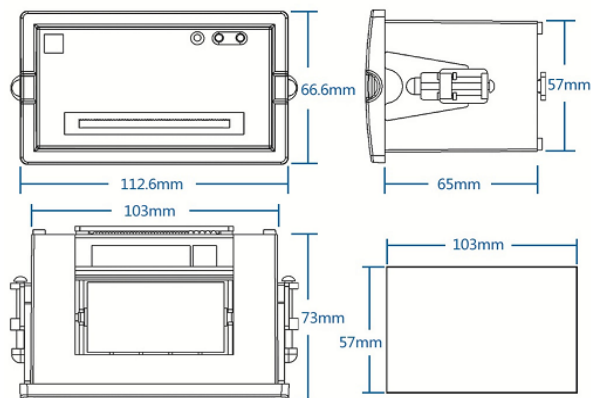
					the printer no. if the mini printer is customized.
USB		U-			USB flash drive to download data to PC, free PC data analysis software offered
Flow totalizer with Temperature and Pressure compensation; Math		N-			None
		F-			Flow totalizer accumulation with compensation; or Basic math: +, -, x, /, min, max, average
Frequency Input		N-			None
		Q1-			1channel 0-5KHZ frequency input
		Q2-			2channel 0-5KHz frequency input
		Q3-			3 channel 0-5KHz frequency input
Power Supply				N	100-24VAC, 47-63HZ

## Optional-Mini Printer

Printer



Size



<b>Printing Method</b>	Dot Matrix, Ribbon Type
<b>Paper Width</b>	44mm/57mm
<b>Print Width</b>	32mm/48mm
<b>Resolution</b>	96dots/line, 144dots/line, 240dots/line
<b>Character per line</b>	16/24/40
<b>Printing Speed</b>	1line/sec, 0.7 line/sec, 0.4line/sec.
<b>Character Size</b>	6x8dots, 8x16dots, 6x 12dots
<b>Paper Type</b>	Plain, 44mm/57mm wide, 30mmΦ

<b>Power Supply</b>	5VDC, 1.5A
<b>Outline Size:</b>	122.6x66.6x73mm
<b>Cut Size</b>	103mm(W)x57mm(H)x65mm(D)
<b>Interface</b>	Serial RS232port
<b>Operate Temperature</b>	0-5C
<b>Storage Temperature</b>	-20 to 60C
<b>Operating Humidity</b>	10%-85%
<b>Storage Humidity</b>	10%-90%