SDY Series

Sensor Meter User Manual

Features:

- The red LED display value of real time, maximum & minimum on the upper row,and the green LED display meansure unit or alarm value.
- Support maximum 3 loop alarms output.
- Support variety of linear signal input or temperature sensor signals.
- Transmission current output, which can realize the transformation and calibration function of the transmission range.
- RS485 communication and adopt standard Modbus-RTU protocol.
- Wide power supply voltage range 100 ~ 240V AC/DC.
- Isolated DC24V feed output (30mA).
- Peak holding function, convenient to record the maximum value and minimum value of the measurement data.
- Easy to operate, economical and practical.

KKSDY8-A01E-A/0-20220929

2.Cable caution:

1)Please use specified compensation wire in the place of TC input;Please use insulated TC if the measured
device is heated metal.

2)Please use the cable of lesser resistance in the place of RTD input,and the cable(3 wire) must be no resistance difference,but the total length is within 5m.

3)In order to avoid the effect of noise,please put the input dignal away from meter cable,power cable,load cable to wiring.

4)In order to reduce the power cables and the load power cables on the effect of this product,please use noise
filter in the place where easy to effect.You must install it on the grounding of the disk if you use the noise filter,and make the wiring to be shortest between noise filter output side and power connectors.Don`t install fuse and switch
on the wiring of noice filter output side,otherwise it will reduce the effect of noise filter.

5)It takes 5s from input power to output.If there is a place with interlocking actions circuit signal,please use timer relay.

6)Please use twisted pair with a shield for analog output line,to ensure the reliabilty of signal.

7)Please use twisted pair with a shield for remote RS485 communication cable,and deal with the shield on the host side earth,otherwise it will reduce the effect of noise filter.

8)This product is not the fuse;please set according to rated voltage 250V,rated current 1A if you need;fuse type:relay fuse.

9)Please use the suitable screw force and crimp terminal.
The screw terminal size: M3X8 (with 6.8X6.8 square base)
Recommended tightening torque: 0.4N.m
Proper cables: 0.25 ~ 1.65mm single cable/multiple core cable

10)Please don`t put the Crimp terminal or bare wire part contact with adjacent connector.

II .Model Illustration

SDY 8□ - I R C 10 B - T - A

- A: Version
- T: Temperature sensor input Blank:Voltage, current input
- B: DC 24V auxiliary voltage Blank:No
- C: DC 10V Auxiliary voltage 6、8、9、80 size(customized)
- 10: single input without RS485 18: Single input with RS485
- A: No alarm C: 2 loop alarm D: 3 loop alarm
- Blank: No alarm R: Relay alarm output
- I: DC 4-20mA analog output Blank:No alalog
- Blank: AC/DC 100~240V power supply F:24V power supply(customized)
- 4: 48W*48H 6: 48W*96H 7: 72W*72H 8: 96W*48H
- 9: 96W*96H 16: 80W*160H 80: 160W*80H
- SDY series sensor indicator

III .Order Information

Model	Signal input	Alarm	Auxiliary voltage	Analog output	485 communication
SDY□-A10	4~20mA/0~10V				
SDY□-A10B	4~20mA/0~10V		●		
SDY□-RC10B	4~20mA/0~10V	2	●		
SDY□-RC18B	4~20mA/0~10V	2	●		●
SDY□-IRC10B	4~20mA/0~10V	2	●	●	
SDY□-IRC18B	4~20mA/0~10V	2	●	●	●
SDY□-A10-T	TC/RTD/mV/RT				
SDY□-RC10B-T	TC/RTD/mV/RT	2	●		

IV. Specification

1.Electrical parameters

Sample rate	4SPS
Relay capacity	AC 250V /3A life of rate load>100 thousand times
Power supply	AC/DC 100 ~ 240V (85-265V) 24V (customized)
Power consumption	<10VA

The instruction explain instrument settings, connections,name etc, please read carefully before you use the temperature controller.

I. Safety Caution

⚠ Warning

1) If the fault of the product or abnormal system lead to a serious accident, please set the appropriate circuit protection outside.
2) Before the connection completely, please do not power. Otherwise it may result in electric shock, fire, malfunction.
3) Do not use the product out of scope of specifications range. Otherwise, it may result in fire, malfunction.
4) Do not use in places with flammable and explosive gas.
5) Do not touch the site of high voltage power terminal site after power. Otherwise, there is danger of electric shock.
6) Do not disassemble, repair and modify this product. Otherwise,it may result in electric shock, fire, malfunction.

⚠ Caution

1) This product should not be used in a nuclear plant and medical equipment which associated with human life.
2) Some time,it will happen radio interference when the product uses in home environment.It should take adequate countermeasures.
3) This product has electric shock protection through improved insulation.And when using the product and connecting,it subject to compliance with specifications.
4) In order to avoid lighting surge,it should set appropriate surge suppression circuits when the product uses in the environment where the total cable lengh more than 30 metre.
5) The product uses in disk,and avoid to touch the part of high voltage,please take the necessary measure on the final product.
6) Please observe the precautions in this manual, otherwise there is risk of causing significant harm or accident.
7) Please observe the regulation when wiring.
8) To prevent to damage the machine and prevent to machine failure, the product is connected with power lines or large capacity input and output lines and other methods please install proper capacity fuse or other methods of protection circuit.
9) Please don't put metal and wire clastic mixed with this product,otherwise it may lead to electric shock, fire, fault.
10) Please tighten screw torque according to the rules.If not,it may lead to electric shock and fire.
11) In order not to interfere with this products to dissipate heat, please don't plug casing around the cooling vent hole and equipment.
12) Please don`t knock or rub the panel with rigid thing.
13) The readers of this manual should have basic knowledge of electrical,control, computer and communications.
14) The illustration, example of data and screen in this manual is convenient to understand,instead of guaranteeing the result of the operation.
15) In order to use this product with safety for long-term,regular maintenance is necessary. The life of some parts of the equipments are by some restrictions, but the performance of some will change for using many years.
16) Without prior notice, the contents of this manual will be change. We hope these is no any loopholes, if you have questions or objections, please contact us.

⚠ Caution of Install & Connection

1.Installation:

1) This product is used in the following environmental standards.
(IEC61010-1) [Overvoltage categoryⅡ, class of pollution 2]

2) This product is used in the following scope:surrounding environment, temperature, humidity and environmental conditions.
Temperature: 0 ~ 50℃; Humidity:45 ~ 85%RH;Environment condition: Indoor warranty,The altitude is less than 2000m.

3) Please avoid using in the following places:
The place will be dew for changing temperature;with corrosive gases and flammable gas;with vibration and impact;with water, oil, chemicals, smoke and steam. facilities with Dust, salt, metal powder;and with clutter interference, static electric and magnetic fields, noise;where has air conditioning or heating of air blowing directly to the site.

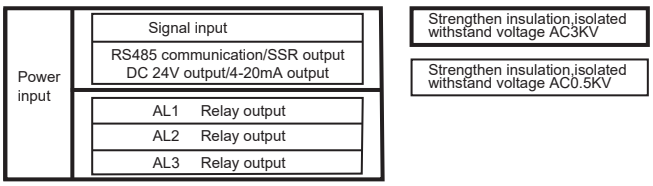
4) On the occasion of the installation, please consider the following before installing several.
In order to protect heat saturated, please ensure adequate ventilation space.
Please consider connections and environment,and ensure that the products below for more than 50mm space.
Please avoid to installed over the machine of the calorific value(Such as heaters, transformer, semiconductor operations, the bulk resistance).
When the surrounding is more than 50℃, please using the force fan or cooling fans.But don't let cold air blowing directly to the product.
In order to improve the anti - interference performance and security, please try to stay away from high pressure machines, power machines to install.
Don`t install on the same plate with high pressure machine and the product.
The distance should be more than 200mm between the product and power line.

Environment	Indoor use, temperature: 0~50 ℃, no condensation, humidity: < 85% RH, altitude less than 2000m
Storage environment	-10~60 ℃, no condensation
Current output	DC 4 ~ 20mA load < 500Ω, Temperature drift 250PPM
Communication port	RS485 port Modbus-RTU procotol, maximum input:30 units
Insulation impedance	Input,output, power cabinet > 20MΩ
ESD	IEC/EN61000-4-2 Contact ±4KV /Air ±8KV perf.Criteria B
Pulse traip anti-interference	IEC/EN61000-4-4 ±2KV perf.Criteria B
Lightning surge	IEC/EN61000-4-5 ±2KV perf.Criteria B
Immunity to voltage sags and short interruptions	IEC/EN61000-4-29 0% ~ 70% perf.Criteria B
Dielectric strength	Signal input & output & power 1500VAC 1min, below 60V Low voltage circuit between DC500V,1min
Total weight	About 400g
Material of hoursing	The case and panel frame PC/ABS (Flame Class UL94V-0)
Material of panel	PC
Power-off data protection	10 years, times of writing:1 million times
Safety Standard	IEC61010-1 Overvoltage category Ⅱ, pollution level 2, levelⅡ(Enhanced insulation)

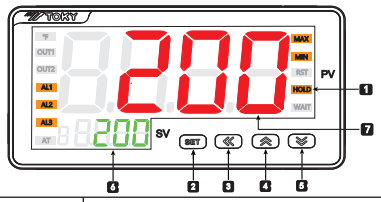
2.Signal parameters

Input	Symbol	Range	Ratio	Accuracy	Input impedance/ auxiliary current	Code
K	E	-50 ~ 1200℃	1℃	0.5%FS±3digits	>500KΩ	0
K.0	E.0	-50.0 ~ 500.0℃	0.1℃	0.5%FS±3digits	>500KΩ	1
J	J	0 ~ 1200℃	1℃	0.5%FS±3digits	>500KΩ	2
E	E	0 ~ 850℃	1℃	0.5%FS±3digits	>500KΩ	3
T	t	-50 ~ 400℃	1℃	0.5%FS±2℃	>500KΩ	4
N	n	-50 ~ 1200℃	1℃	0.5%FS±3digits	>500KΩ	5
B	b	600 ~ 1800℃	1℃	0.5%FS±2℃	>500KΩ	6
R	r	0 ~ 1600℃	1℃	0.5%FS±2℃	>500KΩ	7
S	S	-10 ~ 1600℃	1℃	0.5%FS±2℃	>500KΩ	8
PT100	Pt	-200.0 ~ 600.0℃	0.1℃	0.5%FS±3digits	0.2mA	9
CU50	CU50	-50.0 ~ 150.0℃	0.1℃	0.5%FS±3℃	0.2mA	10
CU100	CU00	-50.0 ~ 150.0℃	0.1℃	0.5%FS±1℃	0.2mA	11
0 ~ 50mV	5U	-1999 ~ 9999	0.01%FS	0.5%FS±3digits	>500KΩ	12
0 ~ 400Ω	rt	-1999 ~ 9999	0.01%FS	0.5%FS±3digits	0.2mA	13
0 ~ 10V	0_10	-1999 ~ 9999	0.01%FS	0.5%FS±3digits	>500KΩ	14
4 ~ 20mA	4_20	-1999 ~ 9999	0.01%FS	0.5%FS±3digits	100Ω	15
0 ~ 5V	0_5U	-1999 ~ 9999	0.02%FS	1%FS±3digits	>500KΩ	16
1 ~ 5V	1_5U	-1999 ~ 9999	0.02%FS	1%FS±3digits	>500KΩ	17
0 ~ 20mA	0_20	-1999 ~ 9999	0.01%FS	0.5%FS±3digits	100Ω	18

3. Block diagram of isolation mode:



V. Panel description



No.	Symbol	Name	Function
1	AL1	Alarm 1 indicator light	1st loop alarm output indication,alarm output with light,no alarm output without light
	AL2	Alarm 2 indicator light	2nd loop alarm output indication,alarm output with light,no alarm output without light
	AL3	Alamr 3 indicator light	3rd loop alarm output indication,alarm output with light,no alarm output without light
	MAX	Light of max value	when the MAX value indicator light,PV display the max value
	MIN	Light of min value	when the MIN value indicator light,PV display min value.
	HOLD	Light of hold value	when HOLD value indicator light,PV display hold value.
2	SET	SET key	Menu/ensure key,switch max/min/current value.
3	«	Shift key	Parameters modify and activate,left shift
4	»	Add/hold key	Increase the flashing value, hold measuring the instantaneous value
5	»	Reduce/reverse key	Reduce the flashing value,reverse to browse menu.
6	PV	Upper display window	Display current/max/min value and parameter symbol,error indication
7	SV	Lower display window	Display measure unit,parameter and alarm value

VI.Name of universal panel

No.	Symbol	Unit	No.	Symbol	Unit	No.	Symbol	Unit
0	_	—	11	n	N	22	KV	KV
1	M	M	12	W	W	23	mA	mA
2	cm	cm	13	KW	KW	24	A	A
3	mm	mm	14	rPM	RPM	25	KA	KA
4	kg	kg	15	rPS	RPS	26	Ω	Ω
5	g	g	16	MPM	MPM	27	KΩ	KΩ
6	mg	mg	17	MPS	MPS	28	℃	℃
7	MPA	Mpa	18	Hz	Hz	29	℉	℉
8	PA	pa	19	KHz	KHz	30	K	K
9	bA	ba	20	mV	mV			
10	mbA	mba	21	V	V			

3. Common menu description

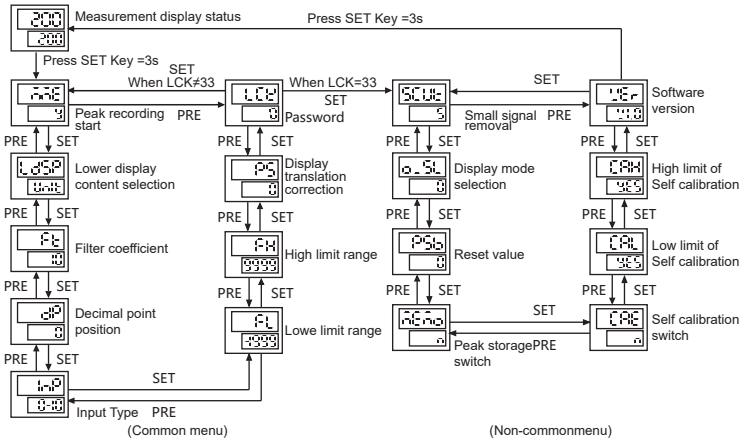
According to the model and settings, there are some hidden parameters

Parameters always displayed regardless of model and setting

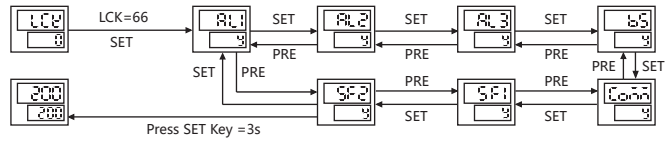
No.	Symbol	Name	Function	Setting range	Factory default
1	MME	**MME**	Max/min value record function activiation. Y:start, N:close	0 (N) 1 (Y)	N
2	AD1	AD1	Optional 4types alarm. 0: alarm close; L:low limit alarm; H:high limit alarm;Int:interval alarm; Out:outside the interval	0、L、H、Int、Out	L
3	AL1	AL1	1st alarm setting value (see logic diagram on page 8)	FL~FH	200
4	AH1	AH1	Upper limit setting value for 1st alarm	FL~FH	1000
5	HY1	HY1	1st alarm hysteresis value	0~1000	1
6	AD2	AD2	Optional 4 types alarm,if it is 0,the alarm close	0、L、H、Int、Out	H
7	AL2	AL2	2nd alarm setting value	FL~FH	600
8	AH2	AH2	Upper limit setting value for 2nd alarm	FL~FH	1000
9	HY2	HY2	2nd alarm hysteresis value	0~1000	1
10	AD3	AD3	Optional 4 types alarm,if it is 0,the alarm close	0、L、H、Int、Out	H
11	AL3	AL3	3rd alarm setting value	FL~FH	800
12	AH3	AH3	Upper limit setting value for 3rd alarm	FL~FH	1000
13	HY3	HY3	3rd alarm hysteresis value	0~1000	1
14	LdSP	**LDSP**	Choice of display on botton row:no display, engineering unit,1loop/2loop/3loop alarm value.	Non、Unit、AL1、AL2、AL3	Unit
15	FT	**FT**	Filter coefficient of digital filters. The higher of value, the greater the filter effect.	1~255	10
16	drEF	**DREF**	Display refresh cycle. The larger the value, the slower the refresh	0~5	0
17	dP	**DP**	Decimal location for linear signal	0~3	0
18	InP	**INP**	Input signal types	See parameter table (page 3)	0~10V/K
19	FL	**FL**	Measured low limit,the setting value must less than measured high limit	See parameter table (page 3)	0/-50
20	FH	**FH**	Measured high limit,the setting value must more than measured low limit	See parameter table (page 3)	1000/1200
21	PS	**PS**	Display translation correction value	-1999~9999	0
22	CAS	CAS	Displayed value of low-input point, setting corresponding value of low-input point, press » to decrease CAS until CAS= OFF , this function is disabled.	OFF，FL ~ FH	OFF
23	CAK	CAK	Displayed value of high-input point, setting corresponding value of high-input point, press » to decrease CAK until CAK= OFF , this function is disabled.	OFF，FL ~ FH	OFF
24	LCK	**LCK**	Password, LCK=01,unit lock; LCK=10,menu lock; LCK=11, unit & menu lock; LCK=33, it can enter class 2 menu; LCK=5555, it will restore factory setting.	0~9999	0

VII. Operation process and menu illustration

1、Common menu and shielded menu operation chart



2、Function shielding menu operation chart



The parameters corresponding to the menu shielding function and function symbol are as follows:

AL1: AD1，AL1，HY1，AE1，DL1A，DL1B；
AL2: AD2，AL2，HY2，AE2，DL2A，DL2B；
AL3: AD3，AL3，HY3，AE3，DL3A，DL3B；
BS: BRL，BRH，OLL，OLH，TEST；
COMM: BAUD，ADDR，DTC；
SF1: CAS，CAK，SQRT；
SF2: DREF,STEP,CJC,RLMR；

When it display one of function symbol,bottom row will display “Y” or “N” (Y means start the function;N means stop the function)

For example:if the meter have no first alarm circuit,please set the AL1 to “N” and then exit menu.

But now,the menu and submenu will not display AL1，AD1，HY1，AE1，DL1A，DL1B and the alarm function stop to work.

1) In the normal measurement mode, and the parameter MME=Y, short press the "SET" key can switch the max/min/current value circularly.

2)Enter MME, and when it displays “Y” , press “« ” key to restart recording max/min value.

3) In the normal measurement mode, press the " » " key briefly to lock the current displayed value, and press it again to unlock it.

4)Before CAS, CAK calibration functions are used, long press "SET"+"» " (ensure PSB=0).

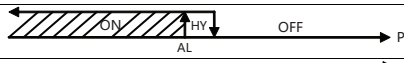
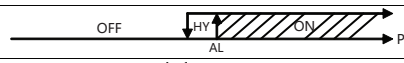
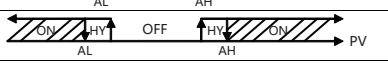
4. Uncommon menu description

No.	Symbol	Name	Function	Setting range	Factory default
25	SCUt	**SCUT**	Small Signal Elimination,please refer description of o_SL for details	-1999~9999	5
26	o_SL	**o_SL**	Display of choice.o_SL=0, no function , o_SL=1, measured value<FL, display FL; measured value>FH, display FH. o_SL=2, measured value< SCUT/FL and display FL; measured value>FH,display FH. o_SL=3,measured value<SCUT, display the min value between FL & SCUT;measured value>FH, display FH.	0~3	0
27	PSb	**PSb**	Reset the value. Long press the SET+ » key clear the display value,now,zero value will save on PSb. If you preset the zero value,you can long press the SET+» key or modify PSb to zero. (The function is non-effective on temperature signal)	-1999~9999	0
28	MEMo	**MEMO**	Max/min power failure protection.Y: open, N:Close (Reserved)	0 (N) 1 (Y)	N
29	SQrt	SQRT	linear signal Square root	0 (N) 1 (Y)	N
30	StEP	STEP	Display jumping interval	1~10	1
31	brL	BRL	Analog output low limit (output 4mA corresponding display value)	FL~FH	FL
32	brH	BRH	Analog output high limit (output 20mA corresponding display value)	FL~FH	FH
33	oLL	OLL	Adjust analog output low limit OLL=(preset analog low limit - actual analog low limit)/actual analog range*1000	-500~1000	0
34	oLH	OLH	Adjust analog output high limit adjustment OLH=(preset analog high limited - actual analog high limit)/actual analog range *1000+1000	0~1050	1000
35	bAUd	BAUD	Baud rate	4.8K、9.6K、19.2K	9.6K
36	Addr	ADDR	Meter communication address	1~255	1
37	dtC	DTC	Communication delay time	See Communication Protocol Remarks (Page 14)	0
38	AE1	AE1	Alarm 1 extension function (see Page 9 Alarm Function Extension Table for details)	0~11	0
39	AE2	AE2	Alarm 2 extended function	0~11	0
40	AE3	AE3	Alarm 3 extended function	0~11	0
41	dL1A	DL1A	Alarm 1 start delay (unit: second)	0~999.9	0.0
42	dL1b	DL1B	Alarm 1 close delay (unit: second)	0~999.9	0.0
43	dL2A	DL2A	Alarm 2 start delay (unit: second)	0~999.9	0.0
44	dL2b	DL2B	Alarm 2 close delay (unit: second)	0~999.9	0.0

45	dL3R	DL3A	Alarm 3 start delay (unit: second)	0~999.9	0.0
46	dL3b	DL3B	Alarm 3 close delay (unit: second)	0~999.9	0.0
47	CJC	CJC	Thermocouple cold end compensation method, auto-compensation, close compensation, manual compensation	-1 (Auto), 0 (Off), 1~50	Auto
48	rLRr	RLMR	linear resistance value, useable when linear resistance is high (Unit: mΩ)	0~9999	0
49	tESt	TEST	Analog input test, used to test output function	FL~FH	OFF
50	CAE	**CAE**	Enable user`s self-calibration, this parameter is for linear signal only; Y: use the parameter self-calibrated byuser; N: don`t use the parameter self-calibrated by user	0 (N), 1 (Y)	N
51	CAL	**CAL**	User set the low-limit input by themselves; after input the low-limit signal, flash display YES, press "SET " to confirm, when it display OK, the input signal low-limit is set.	YES/OK	YES
52	CAH	**CAH**	User set the high-limit input by themselves; after inputthe high-limit signal, flash display YES, press "SET " to confirm, when it display OK, the input signal high-limitis set.	YES/OK	YES
53	VEr	**VER**	Software version	Unable to set	V1.0

1. High/low point display setting function
Example: use electronic ruler or others to measure distance, if want position 5mm display 500, position 6mm display 600, firstly enter function shielding menu to set SF1= Y(open CAS, CAK parameter), then while the position is at 5mm, enter the menu to set
CAS=500; while the position is at 6mm, enter the menu to set CAS=600. After exit the menu, it will corresponding indicate 500~600 between 5mm and 6mm.
2. Linear signal self-calibration function
a) Set INP type, and make sure it is one of the linear signal.
b) The input signal should be applied to the correct input channel.
c) Enter low limit calibration menu CAL, press "《" to flash "YES" ; after adjusting the input signal to the minimum value, then input it to the meter.
d) When "YES" flashing, and the minimum value of input signal has been inputed into the meter; press " " to confirm and save calibration value.
e) After the low limit is calibrated, enter high limit calibration menu CAH, and flash "YES" in the same way.
f) Adjust the input signal to the maximum value, and input it into the meter. And when "YES" flashing, press " " to confirm and save calibration value of high limit.
g) After calibration, enter CAE to change "N" into "Y" to enable self-calibration; otherwise, it will use the default calibration value.
h) The calibrated high limit input value of linear signal should not fall outside the input standard range ±10%.
i) After the calibration, if the result is not satisfactory, it can be recalibrated.
3. Analog range calibration function
Example: actual high limit is 20.4mA, low limit is 3.97mA. To calibrate the analog range through the modification of OLL, OLH.
OLL= (Preset analog low limit - actual analog low limit)/ actual analog range*1000 =(4.0 - 3.97)/(20.4 - 3.97) * 1000 = 2
OLH= (Preset analog high limit - actual analog high limit)/ actual ananlog range*1000+1000 = (20.0 - 20.4)/(20.4 - 3.97) * 1000 +1000 =976

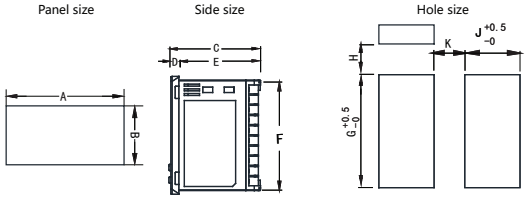
VIII. Alarm parameters and output logic diagram

Alarm code	Alarm Mode	Logic diagram
L	Absolute value low limit alarm	
H	Absolute value high limit alarm	
Int	Interval alarm	
oUt	Deviation alarm	

Alarm expansion menu

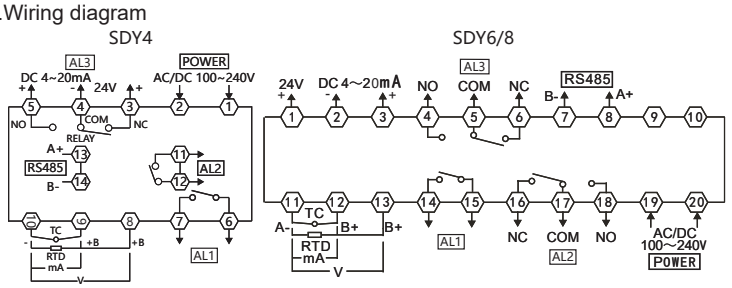
AE1/AE2/AE3 value	Alarm mode when show over limit	Whether restrain alarm when power on	Alarm control fineness
0	State invariant	Do not inhibit (As long as it meets the requirement of alarm, alarm output)	Alarm control with the highest resolution of the instrument
1	Forced alarm output		
2	Forced alarm close		
3	State invariant	Inhibit (Forced alarm close when power on;alarm does not output until the alarm condition from noncoincidence to coincidence.)	
4	Forced alarm output		
5	Forced alarm close		
6	State invariant	Do not inhibit (As long as it meets the requirement of alarm, alarm output)	Alarm control with display resolution
7	Forced alarm output		
8	Forced alarm close		
9	State invariant	Inhibit (Forced alarm close when power on;alarm does not output until the alarm condition from noncoincidence to coincidence.)	
10	Forced alarm output		
11	Forced alarm close		

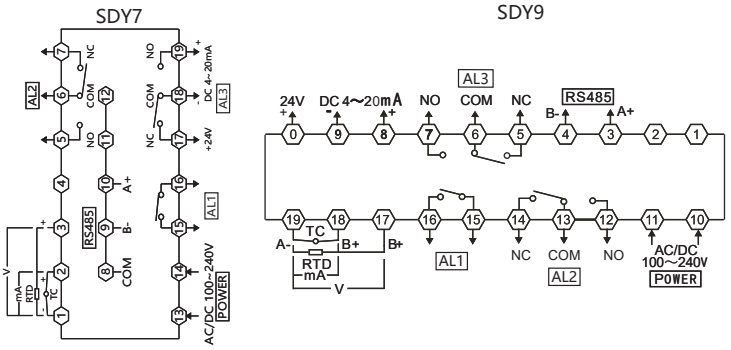
IX.Dimensions and installation hole size



Model	A	B	C	D	E	F	G	H(Min)	J	K(Min)
4:(48*48)	48	48	73	6.5	66.5	44	45	25	45	25
6:(48*96)	48	96	73	6.5	66.5	90	91.5	25	45	25
7:(72*72)	72	72	73	6.5	66.5	66	67.5	25	67.5	25
8:(96*48)	96	48	73	6.5	66.5	44	45	25	91.5	25
9:(96*96)	96	96	73	6.5	66.5	90	91.5	25	91.5	25

X.Wiring diagram





Note: If there is any change, please subject to the drawing on the meter.

XI. Checking methods of simple fault

Display	Checking methods
LLLL/HHHH	Checks whether the input disconnection and whether normal of FH/ FL value, working environment temperature and whether input signal is selected correctly.

XII. Communication procotol

Meter adopt Modbus RTU communication protocol, RS485 half duplex communication.
Read function code:0x03,write function code 0x06 or 0x10. Adopts 16 digit CRC check, the meter does not return for error check.
Data frame format:

Start bit	Data bit	Stop bit	Check bit
1	8	1	NO

Handling of abnormal communication:
When abnormal response，put 1 on the top bit of function code. For example: Host request function code 0x03,and slave response function code should be 0x83.
Error code:
0x01--- Illegal function: the function code sent from host is not supported by meter.
0x02--- Illegal address: the register address designated by host beyond the address range of meter.
0x03--- Illegal data: Date value sent from host exceeds the corresponding data range of meter.
Communication cycle：
Communication cycle is the time from host request to slave response data, i.e.: communication cycle= time of request data sending +slave preparation time + response delay time + response return time, e.g.:9600 Baud rate:communication cycle of single measured data ≥250ms.

1. Read register（0x03）
For example:Host reads integer AL1(AL1=200)
The address code of AL1 is 0x3201, because AL1 is integer(2 dyte), seizes 1 data register. The memory code of decimal integer 200 is 0x00C8. Note: when reading data, should read DP value or confirm DP menu value first to ensure the decimal point postion, after that transform the read data to get the actual value. Conversely, it should transform the data to corresponding ratio before writing the data in meter.

Host request (read multiple registers)							
1	2	3	4	5	6	7	8
Meter ADD	Function code	Start ADD High bit	Start ADD Low bit	Data byte Length high bit	Data byte Length low bit	※CRC code low bit	※CRC code high bit
0x01	0x03	0x32	0x01	0x00	0x01	0xDB	0x72

Slave normal answer(Read multi-register)						
1	2	3	4	5	6	7
Meter ADD	Function code	Data byte quantity	Data high bit	Data low bit	※CRC code low bit	※CRC code high bit
0x01	0x03	0x02	0x00	0xC8	0xB9	0xD2

Address error abnormal answer: (For example: host request ADD is 0x2101)

Slave response error code				
1	2	3	4	5
Meter ADD	Function code	Error code	※CRC code low bit	※CRC code high bit
0x01	0x83	0x02	0xC0	0xF1

2 Write multi-register (0x06)
For example: Host writes AL1（First alarm set value 100）
The address code of AL1 is 0x3201, because AL1 is integer (2 dyte), seizes 1 data register. The hexadecimal memory code for decimal integer 100 is 0x0064.

Host request (write single register)							
1	2	3	4	5	6	7	8
Meter ADD	Function code	Data Add high bit	Data Add low bit	Data high bit	Data low bit	CRC code low bit	CRC code high bit
0x01	0x06	0x32	0x01	0x00	0x64	0xD7	0x59

Slave normal answer (write single register)							
1	2	3	4	5	6	7	8
Meter ADD	Function code	Data Add high bit	Data Add low bit	Data high bit	Data low bit	CRC code low bit	CRC code high bit
0x01	0x06	0x32	0x01	0x00	0x64	0xD7	0x59

Address error abnormal response: (for example, the host request address is 0x2101)

Slave answer error code				
1	2	3	4	5
Meter ADD	Function code	Error code	CRC code low bit	CRC code high bit
0x01	0x86	0x02	0xC3	0xA1

3.Write register (0x10)

For example: host writes AL1 (First alarm set value 100)

Host request (Write register)										
1	2	3	4	5	6	7	8	9	10	11
Meter ADD	Function code	Start ADD High bit	Start ADD Low bit	Data byte Length high bit	Data byte Length low bit	Data byte Length	Data high bit	Data low bit	CRC code low bit	CRC code high bit
0x01	0x10	0x32	0x01	0x00	0x01	0x02	0x00	0x64	0xB5	0xA9

Slave normarl answer (Write register)							
1	2	7	4	5	6	7	8
Meter ADD	Function code	Start ADD High bit	Start ADD Low bit	Data byte Length high bit	Data byte Length low bit	CRC code low bit	CRC code high bit
0x01	0x10	0x32	0x01	0x00	0x01	0x5E	0xB1

Data location error response:(For example:Host request write ADD index is 0x2100)

Slave answer error code				
1	2	3	4	5
Meter ADD	Function code	Error code	CRC code low bit	CRC code high bit
0x01	0x90	0x02	0xCD	0xC1

4、Address Mapping Table of Meter Parameters

No.	ADD mapping	Variable name	Register number	Read/write	Remark
1	0x3000	PV Measure value	2	R	Collocate with DP value to read value
2	0x3001	MAX Maximum measure value	2	R	Collocate with DP value to read value
3	0x3002	MIN Minimum measure value	2	R	Collocate with DP value to read value
4	0x3003	HOLD Hold measured value	2	R	Collocate with DP value to read value
5	0x3004	STA Output status word	2	R	Note①(Page 15)
Reserve					
6	0x3100	FL Measuring range low limit	2	R/W	Collocate with DP value to read value
7	0x3101	FH Measuring range high limit	2	R/W	Collocate with DP value to read value
8	0x3102	INP Input signal type	2	R/W	Refer to measure signal parameter table(Page 3)
9	0x3103	DP Decimal point	2	R/W	Effective for all quantities-related parameter

10	0x3104	UNIT Unit setting	2	R/W	Refer to symbol table (Page 4)
11	0x3105	PS Translation correct	2	R/W	Collocate with DP value to read value
12	0x3106	CAS limit point display value setting	2	R/W	Set the low input point corresponding display value
13	0x3107	CAK high point display value setting	2	R/W	Set the high input point corresponding display value
14	0x3108	FT Filter constants	2	R/W	1~255
15	0x3109	DREF Display refresh cycle	2	R/W	Unit: second
16	0x310A	SCUT Small Signal Elimination	2	R/W	Collocate with DP value to read value
17	0x310B	PSb Zero clearing value	2	R/W	Collocate with DP value to read value
18	0x310C	oSL Display method option	2	R/W	Refer to menu illustration (Page 7)
19	0x310D	LDSP Lower line display content option	2	R/W	Non(0)、Unit(1)、AL1(2)、AL2(3)、AL3(4)
20	0x310E	STEP Display jumping interval	2	R/W	Set the minimum step value of display change
21	0x310F	MME Maximum/minimum value record function	2	R/W	0:N; 1:Y
22	0x3110	MEMO Enable power failure memory	2	R/W	0:N; 1:Y
23	0x3111	SQRT Enable linear signal square root	2	R/W	0:N; 1:Y
24	0x3112	CJC Thermocouple cold end compensation method	2	R/W	-1: Auto compensation 0: No compensation (1~50) Manual input cold end temperature
25	0x3113	RLMR linear resistance value	2	R/W	Unit: mOhm
Reserve					
26	0x3200	AD1 1st loop alarm type	2	R/W	0:no alarm、1:L、2:H、3:Int、4:Out
27	0x3201	AL1 1st loop alarm value	2	R/W	FL~FH Collocate with DP value to read value
28	0x3202	AH1 1st alarm interval high limit value	2	R/W	FL~FH Collocate with DP value to read value
29	0x3203	HY1 1st loop alarm backlash value	2	R/W	Read this value with DP value together
30	0x3204	AE1 1st loop alarm extended function	2	R/W	Refer to alarm extention table (Page 9)
31	0x3205	DL1A 1st loop alarm start delay	2	R/W	10 corresponding to 1.0 second
32	0x3206	DL1B 1st loop alarm close delay	2	R/W	10 corresponding to 1.0 second
33	0x3207	AD2 2nd loop alarm type	2	R/W	0:no alarm、1:L、2:H、3:Int、4:Out
34	0x3208	AL2 2nd loop alarm value	2	R/W	FL~FH Collocate with DP value to read value
35	0x3209	AH2 2nd alarm interval high limit value	2	R/W	FL~FH Collocate with DP value to read value
36	0x320A	HY2 2nd loop alarm backlash value	2	R/W	0~1000Collocate with DP value to read value
37	0x320B	AE2 2nd loop alarm extended function	2	R/W	Refer to alarm extention table (Page 9)
38	0x320C	DL2A 2nd loop alarm start delay	2	R/W	10 corresponding to 1.0 second
39	0x320D	DL2B 2nd loop alarm close delay	2	R/W	10 corresponding to 1.0 second
40	0x320E	AD3 3rd loop alarm type	2	R/W	0:no alarm、1:L、2:H
41	0x320F	AL3 3rd loop alarm value	2	R/W	FL~FH Collocate with DP value to read value

42	0x3210	AH3 3rd alarm interval high limit value	2	R/W	FL~FH Collocate with DP value to read value
43	0x3211	HY3 3rd loop alarm backlash value	2	R/W	0~1000 Collocate with DP value to read value
44	0x3212	AE3 3rd loop alarm extended function	2	R/W	Refer to alarm extention table (Page 9)
45	0x3213	DL3A 3rd loop alarm start delay	2	R/W	10 corresponding to 1.0 second
46	0x3214	DL3B 3rd loop alarm close delay	2	R/W	10 corresponding to 1.0 second
Reserve					
47	0x3301	BRL analog output low limit	2	R/W	FL~FH Collocate with DP value to read value
48	0x3302	BRH analog ouptut high limit	2	R/W	FL~FH Collocate with DP value to read value
49	0x3303	OLL analog output low limit adjustment	2	R/W	-500~1000
50	0x3304	OLH analog output low limit adjustment	2	R	0~1050
51	0x3305	TESE Analog input test enable	2	R	0:close、1:open
52	0x3306	TEST Analog input test	2	R/W	Analog display input, test output function
Reserve					
53	0x3400	LCK Lock	2	R/W	When LCK=11, other parameter can not be written
54	0x3401	ADDR Meter communication address	2	R/W	1~255
55	0x3402	BAUD Baud rate	2	R/W	0:4.8K、1:9.6K、2:19.2K
56	0x3403	DTC Communication configuration byte	2	R/W	Note② (Page 15)
57	0x3404	NAME meter name	2	R	208: SD8
58	0x3405	VER Software version code	2	R	10 : V1.0

R: Read only; R/W: Read & write

Note①: Measurement status indication. When the data bit is 1, it means execution, and when it is 0, it means no execution.

D7	D6	D5	D4	D3	D2	D1	D0
HHHH	LLLL	MIN	HOLD	MAX	AL3	AL2	AL1

Note ②: Description of DTC communication configuration

DTC: □ □ □
- ones place, response delay: 0~9 represents 10~100ms respectively
- tens place,byte transmission sequence: when 0: from high to low; When it is 1: from low to high
- hundreds place,Reserved

※16-bit CRC check code to get C program

```
unsigned int Get_CRC(uchar *pBuf, uchar num)
{
  unsigned i,j;
        unsigned int wCrc = 0xFFFF;
        for(i=0; i<num; i++)
        {
                wCrc ^= (unsigned int)(pBuf[i]);
                for(j=0; j<8; j++)
                {
                        if(wCrc & 1){wCrc >>= 1; wCrc ^= 0xA001; }
                        else
                                wCrc >>= 1;
                }
        }
   return wCrc;
}
```