

# SV Series Sensor Meter User Manual



## Features:

- ⊙TC/RTD/Analog Signal Universal Input;
- ⊙Multi Display Units can be choosed;
- ⊙With Display, Alarm and Current Transmit function;
- ⊙With RS485 Communication Function;
- ⊙Power Supply: 100--240VAC

For your safety, please read following Notice Information carefully before you are using our product!!

## ■ Safe Caution

※ Please read the manual carefully before you use the temperature controller.

※ Please comply with the below important points.

⚠ Warning An accident may happen if the operation does not comply with the instruction.

⚠ Notice An operation that does not comply with the instruction may lead to product damage.

※ The instruction of the symbol in the manual is as below.

⚠ An accident danger may happen in a special condition.

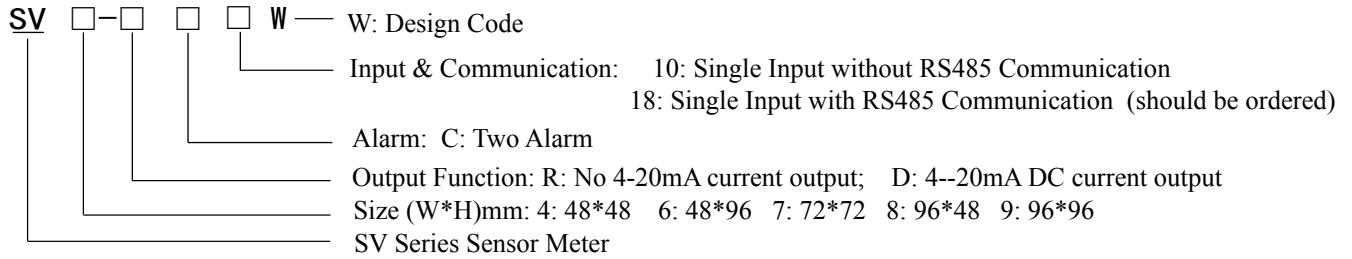
## ⚠ Warning

1. A safety protection equipment must be installed or please contact with us for the relative information if the product is used under the circumstance such as nuclear control, medical treatment equipment, automobile, train, airplane, aviation and equipment etc. Otherwise, it may cause serious loss, fire or person injury.
2. A panel must be installed, otherwise it may cause creepage (leakage).
3. Do not touch wire connectors when the power is on, otherwise you may get an electric shock.
4. Do not dismantle or modify the product. If you have to do so, please contact with us first. Otherwise it may cause electric shock and fire.
5. Please check the connection number while you connect the power supply wire or input signal, otherwise it may cause fire.

## ⚠ Caution

1. This product cannot be used outdoors. Otherwise the working life of the product will become shorter, or an electric shock accident may happen.
2. When you connect wire to the power input connectors or signal input connectors, the moment of the No.20 AWG (0.50 mm<sup>2</sup>) screw tweaked to the connector is 0.74n.m - 0.9n.m. Otherwise the connectors may be damaged or get fire.
3. Please comply with the rated specification. Otherwise it may cause electric shock or fire, and damage the product.
4. Do not use water or oil base cleaner to clean the product. Otherwise it may cause electric shock or fire and damage the product.
5. This product should be avoid working under the circumstance that is flammable, explosive, moist, under sunshine, heat radiation and vibration. Otherwise it may cause explosion.
6. In this unit it must not have dust or deposit, otherwise it may cause fire or mechanical malfunction.
7. Do not use gasoline, chemical solvent to clean the cover of the product because such solvent can damage it. Please use some soft cloth with water or alcohol to clean the plastic cover.

# 1. Model



# 2. Model Indication

Model	Alarm	4-20mA current transmit	RS485
SV□-RC10W	2	NO	NO
SV□-DC10W	2	YES	NO
SV□-RC18W	2	NO	YES
SV□-DC18W	2	YES	YES

# 3. Main Technical Specification

## 1. Whole Meter Parameters

Power Supply	100~240V AC/DC
Total Current	<30mA (220VAC/50Hz)
Analog Output	4~20mA current output, Load resistance 600Ωmax
Alarm Output	Relay output load ability: 1A/230VAC
Auxiliary Voltage Output	DC 24V/30mA
Dielectric Strength	Dielectric strength between power supply terminal, Relay terminal and Signal input terminal over than 2000VAC 50HZ 1Minute
Communication	RS485, Modbus RTU Protocol
Protective Level	IP65
Working Environment	0~50℃ 45~80RH%
Storage Environment	-10~60℃ 25~85RH%

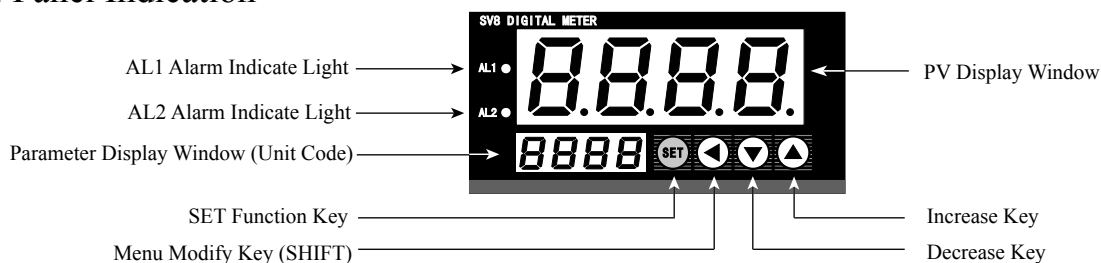
## 2. Input Parameters

No.	Code	Input Type	Measuring Range	Resolution	Accuracy	Input Resistance
0	℄	K	-50~1200℃	1℃	±0.5%F.S±3digits	>100KΩ
1	℄	J	0~1200℃	1℃	±0.5%F.S±3digits	>100KΩ
2	℄	E	0~850℃	1℃	±0.5%F.S±3digits	>100KΩ
3	℄	T	-50~400℃	1℃	±0.5%F.S±3digits	>100KΩ
4	℄	B	600~1800℃	1℃	±0.5%F.S±3digits	>100KΩ
5	℄	R	500~1600℃	1℃	±0.5%F.S±3digits	>100KΩ
6	℄	S	-10~1600℃	1℃	±0.5%F.S±3digits	>100KΩ
7	℄	N	-50~1200℃	1℃	±0.5%F.S±3digits	>100KΩ
8	℄	PT100	-199.9~650.0℃	0.1℃	±0.5%F.S±3digits	(0.2mA)
9	℄	CU50	-50.0~150.0℃	0.1℃	±0.5%F.S±3digits	(0.2mA)
10	℄	CU100	-50.0~150.0℃	0.1℃	±0.5%F.S±3digits	(0.2mA)
11	℄	0~50mV	0~50mV	1digit	±0.5%F.S±3digits	>100KΩ
12	℄	4~20mA	0~20mA	1digit	±0.5%F.S±3digits	<150Ω
13	℄	0~10V	0~10V	1digit	±0.5%F.S±3digits	>47KΩ
14	℄	0~400Ω	0~400Ω	1digit	±0.5%F.S±3digits	>100KΩ

## 3. Unit and Code Reference Table

No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Code	℄	℄	℄	℄	℄	℄	℄	℄	℄	℄	℄	℄	℄	℄	℄	℄	℄	℄	℄	℄	℄	℄	℄	℄	℄	℄
Unit	M	cm	mm	kg	g	mg	Mpa	pa	ba	Mba	N	W	KW	RPM	Hz	KHz	mV	V	KV	mA	A	KA	Ω	KΩ	℃	℉

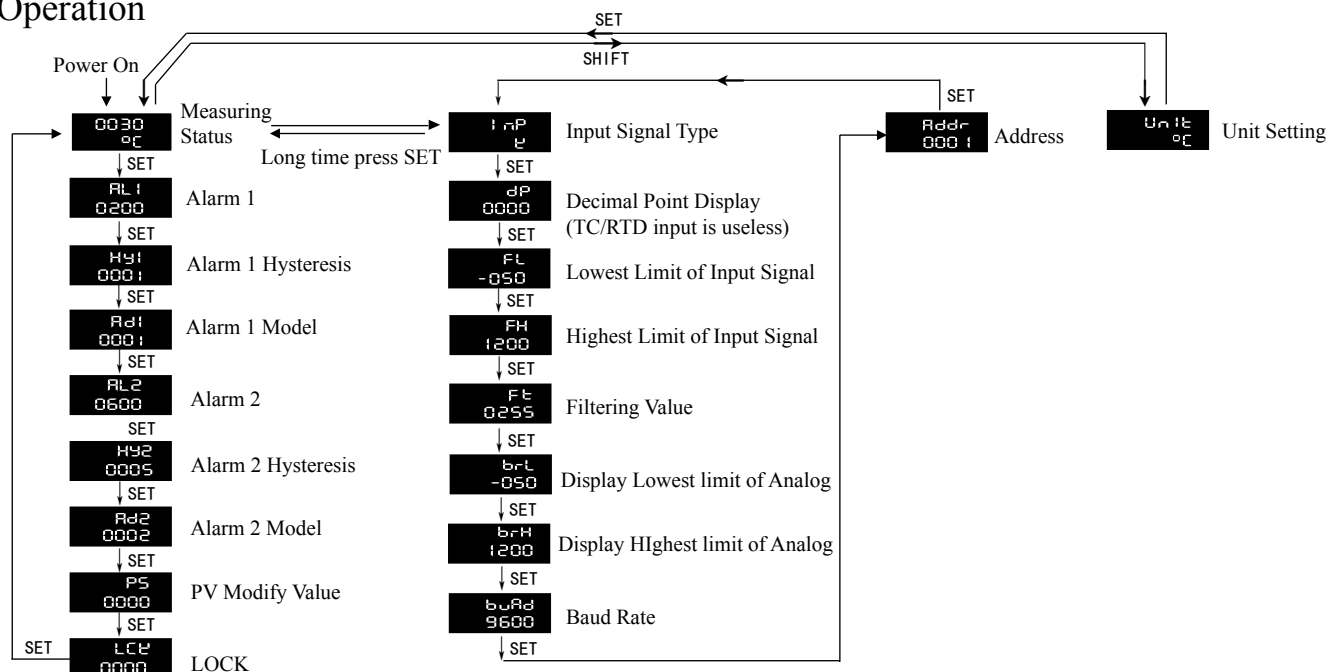
# 4. Panel Indication



## 5. Operation Sequence

1. SET Key: Under measuring status, short press SET key to enter into primary setting menu, long time press SET key can enter into advanced setting menu (press SET key again -long time pressing-can return back to measuring status), SET key should be pressed after each parameter be modified.
2. ◀ (SHIFT) key: Under measuring status, short time press ◀ key, PV window will show Unit, then press ▲ key to choose the display unit : M, cm, mm, kg, g, mg, Mpa, pa, ba, Mba, n, W, KW, RPM, Hz, KHz, mV, V, KV, mA, KA, Ω, KΩ, °C, °F. When the input signal is TC, Unit just can be choosed from °C and F, when modify the menu, short press ◀ key can let the value which need be modified flash from right to left, when the value flash, press ▲ key and ▼ key can make change on the value.
3. ▲ / ▼ Key: Press ▲ key the value will increase, press ▼ key the value will decrease.
4. If there is no operation for some time, the meter will return back to the measuring status automatically.

## 6. Operation



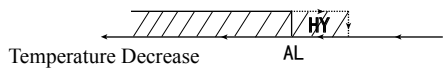
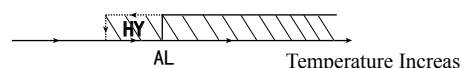
## 7. Primary Menu Setting

Parameter Name	Illustration	Setting Range	EX-Factory Setting
<b>AL 1</b>	#1 Alarm Setting Value	FL - FH	200
<b>HY 1</b>	#1 Alarm Hysteresis Value	0 - FH	1
<b>Ad 1</b>	# 1 Alarm Mode: 1: Absoult Lowest Limit Alarm; 2: Absoult Highest Limit Alarm	1-2	1
<b>AL 2</b>	#2 Alarm Setting Value	FL - FH	600
<b>HY 2</b>	#2 Alarm Hysteresis Value	0 - FH	5
<b>Ad 2</b>	# 2 Alarm Mode: 1: Absoult Lowest Limit Alarm; 2: Absoult Highest Limit Alarm	1-2	2
<b>PS</b>	PV Measuring Value Modify	-1999-9999	0
<b>LCK</b>	LOCK Key: LCK=0001, only modify alarm value; LCK=0010, all the parameters can not be changed (except LCK menu)	0-9999	0

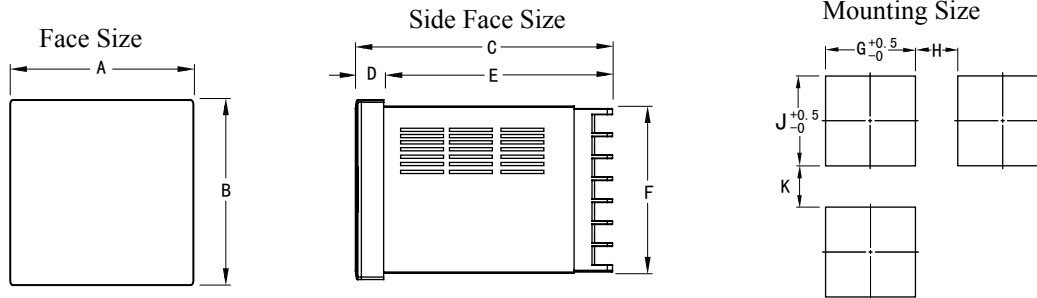
## 8. High Advanced Menu Setting

Parameter Name	Illustration	Setting Range	EX-Factory Setting
<b>InP</b>	Input Signal Type	Reference Table	K
<b>FL</b>	Input Signal Display Low Limit	Reference Table	-50
<b>FH</b>	Input Signal Display High Limit	Reference Table	1200
<b>dP</b>	Decimal Point Setting (display only for Voltage, Ampere and Resistance signal input)	0-3	0
<b>Ft</b>	Filtering Value. The larger for the vlaue, the slower for the change on the Meter; The smaller for the value, the quicker for the change on the Meter	0-255	255
<b>brL</b>	Display Value for the Analog Low Limit	FL - FH	-50
<b>brH</b>	Display Value for the Analog High Limit	FL - FH	1200
<b>buAd</b>	RS485 Communication Baud Rate	4800、 9600	9600
<b>Addr</b>	RS485 Communication Meter Address	1-255	1

Alarm Function Table

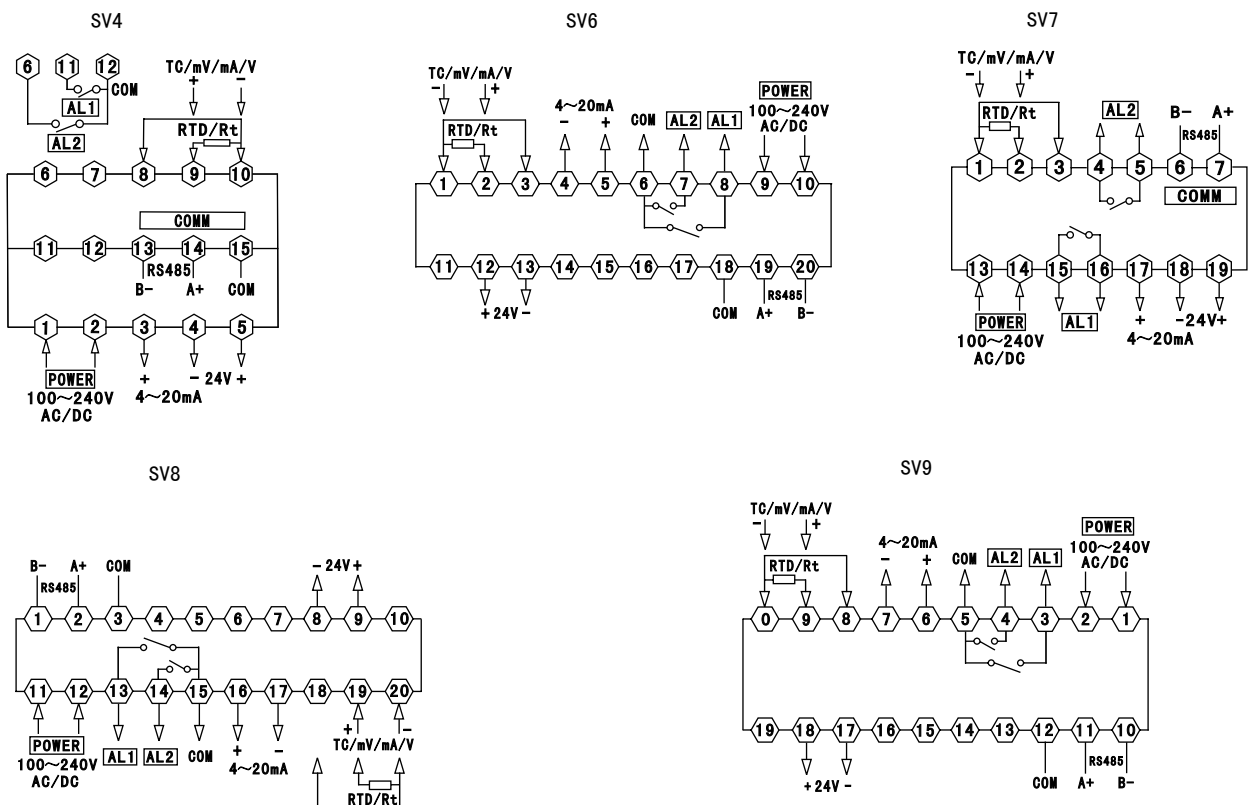
Alarm No	Alarm Type	Alarm Output (AL1, AL2 mutual independence)
1	Absolut Low Limit Alarm	
2	Absolut High Limit Alarm	

## 9. Dimension and Installation



Size	A	B	C	D	E	F	G	H(Min)	J	K(Min)
4:(48*48)	48	48	97.5	3	94.5	45	45.5	25	45.5	25
6:(96*48)	48	96	97.5	3	94.5	89.5	45	25	90	25
7:(72*72)	72	72	97.5	3	94.5	67	67.5	25	67.5	25
8:(48*96)	96	48	97.5	3	94.5	44.5	90	25	45	25
9:(96*96)	96	96	97.5	3	94.5	91.5	92	25	92	25
80:(80*160)	160	80	96	13	83	75.5	155.5	30	76	30
16:(160*80)	80	160	96	13	83	155	76	30	155.5	30

## 10. Connection Drawing



Note: If there is any change, please refer to the drawing on the Meter!

## 11. Simple Problem Shooting

Display Message	Shooting Method
Display HHHH	Input disconnect or over upper limit, please check input signal, FH value and ambient working temperature
Display LLLL	Input disconnect or under lower limit, please check input signal, FH value and ambient working temperature

## 12. Communication

SV series Sensor Meter following Modbus RTU communication protocol, and it can run RS485 half-duplex communication. Read function code is 0x03, write function code is 0x10, 16-bit CRC checking is applied. The coulometer can not return error message.

Data Frame flag:

Start bit	Data bit	Stop bit	Check bit
1	8	2	None

### 1. Read Multiple Registers

For example: The host computer read the float number AL1 (The value of Alarm 1 is 14.5). The address code of AL1 is 0x0000, for AL1 is float number (4bits), it will occupy 2 data register. Reference IEEE-754 standard the hexadecimal 16 result of the decimal float number is 0x66667641.

Request from the host computer (Read Multiple Registers)							
1	2	3	4	5	6	7	8
Unit Address	Function Code	Start Address Hi	Start Address Lo	Data Length Hi	Data Length Lo	CRC Code Lo	CRC Code Hi
0x01	0x03	0x00	0x00	0x00	0x04	0x44	0x09

Correct answer from slave unit (Read Multiple Registers)								
1	2	3	4	5	6	7	8	9
Unit Address	Function Code	Data Byte No.	Data 1 High byte	Data 1 Low byte	Data 2 High byte	Data 2 Low byte	CRC Code Lo	CRC Code Hi
0x01	0x03	0x04	0x66	0x66	0x76	0x41	0xF4	0xE2

### 2. Write Multiple Registers

For example: The host computer read the float number AL1 (The value of Alarm 1 is 60). The address code of AL1 is 0x0000, for AL1 is float number (4bits), it will occupy 2 data register. Reference IEEE-754 standard the hexadecimal 16 result of the decimal float number is 0x66667641.

Request from the host computer (Read Multiple Registers)												
1	2	3	4	5	6	7	8	9	10	11	12	13
Unit Address	Function Code	Start Address Hi	Start Address Lo	Data Length Hi	Data Length Lo	Data Byte No.	Data 1 High byte	Data 1 Low byte	Data 2 High byte	Data 2 Low byte	CRC Code Lo	CRC Code Hi
0x01	0x10	0x00	0x00	0x00	0x02	0x04	0x00	0x00	0x16	0x44	0xFD	0xFC

Correct answer from slave unit (Write Multiple Registers)							
1	2	3	4	5	6	7	8
Unit Address	Function Code	Start Address Hi	Start Address Lo	Data Length Hi	Data Length Lo	CRC Code Lo	CRC Code Hi
0x01	0x10	0x00	0x00	0x00	0x02	0xC8	0x41

SV Series Meter Address Reference Table

No.	Address	Name	Type	Data Number	Read / Write	Note
0	0x0000	# 1 Alarm AL1	float	4	R/W	
1	0x0001	# 1 Alarm Hysteresis HY1	float	4	R/W	①
2	0x0002	# 1 Alarm Type AD1	float	4	R/W	
3	0x0003	# 2 Alarm AL2	float	4	R/W	
4	0x0004	# 2 Alarm Hysteresis HY2	float	4	R/W	①
5	0x0005	# 2 Alarm Type AD2	float	4	R/W	

No.	Address	Name	Type	Data Number	Read / Write	Note
6	0x0009	Modify Value PS	float	4	R/W	
7	0x000A	Input Signal Type INP	float	4	R/W	②
8	0x000B	Display Up Limit FH	float	4	R/W	
9	0x000C	Display Low Limit FL	float	4	R/W	
10	0x000D	Decimal Point DP	float	4	R/W	
11	0x000E	Filtering Setting Value	float	4	R/W	
12	0x000F	Analog Low Limit Value BRL	float	4	R/W	
13	0x0010	Analog High Limit Value BRH	float	4	R/W	
14	0x0012	Unit Setting	float	4	R/W	③
15	0x0013	Baud Rate BUAD	float	4	R/W	
16	0x0014	Address ADDR	float	4	R/W	
17	0x0015	Lock Setting	float	4	R/W	
18	0x0016	Menu Shield	float	4	R/W	
19	0x0032	Measuring Value	float	4	R	
20	0x0033	# 1 Alarm Status	float	4	R	①
21	0x0034	# 2 Alarm Status	float	4	R	①

R: Read Only R/W: Read / Write

For Each Parameter's Setting Range, Please Refer to The Operation User Manuel

Note ① Alarm Mode

Alarm Type	Low Limit Alarm	High Limit Alarm
Reference	1	2

Alarm Status	ON	OFF
Reference	1	0

Note ②: Input Signal (Input parameter meter)

Note ③: Code and Value reference table (refer to unit code reference table)

Acquiring Schedule of 16 units CRC code

```

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;
}

```