

SV Series Sensor Meter User Manual



Features:

- ⊙ TC/RTD/Analog Signal Universal Input;
- ⊙ Multi Display Units can be chosen;
- ⊙ 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.

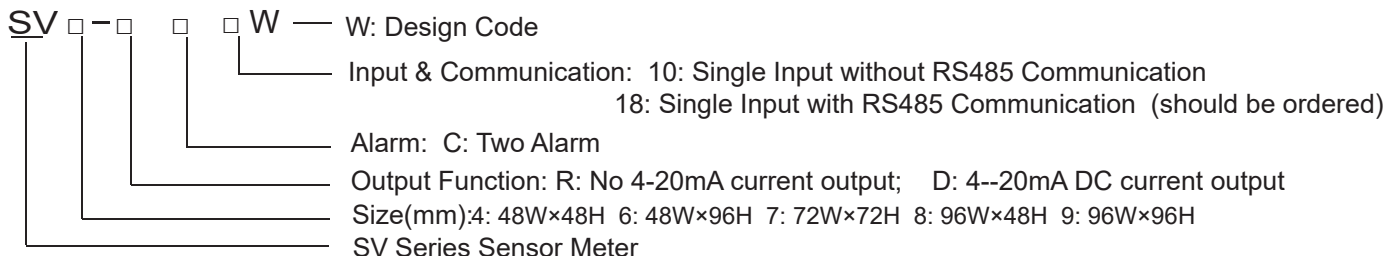
⚠ Warning

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 mm²) 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°C 45~80RH%
Storage Environment	-10~60°C 25~85RH%

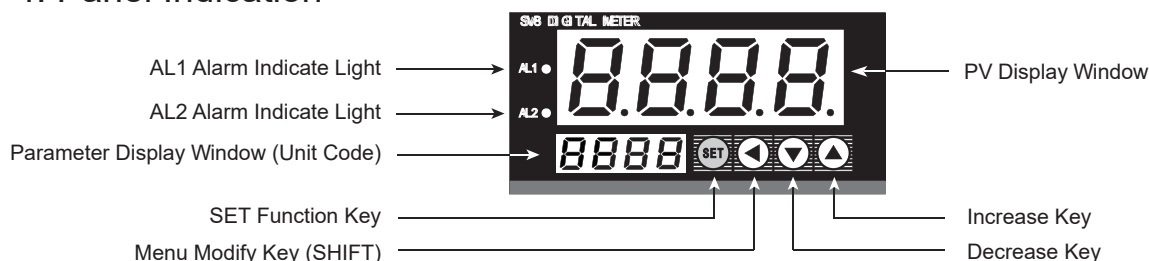
2. Input Parameters

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

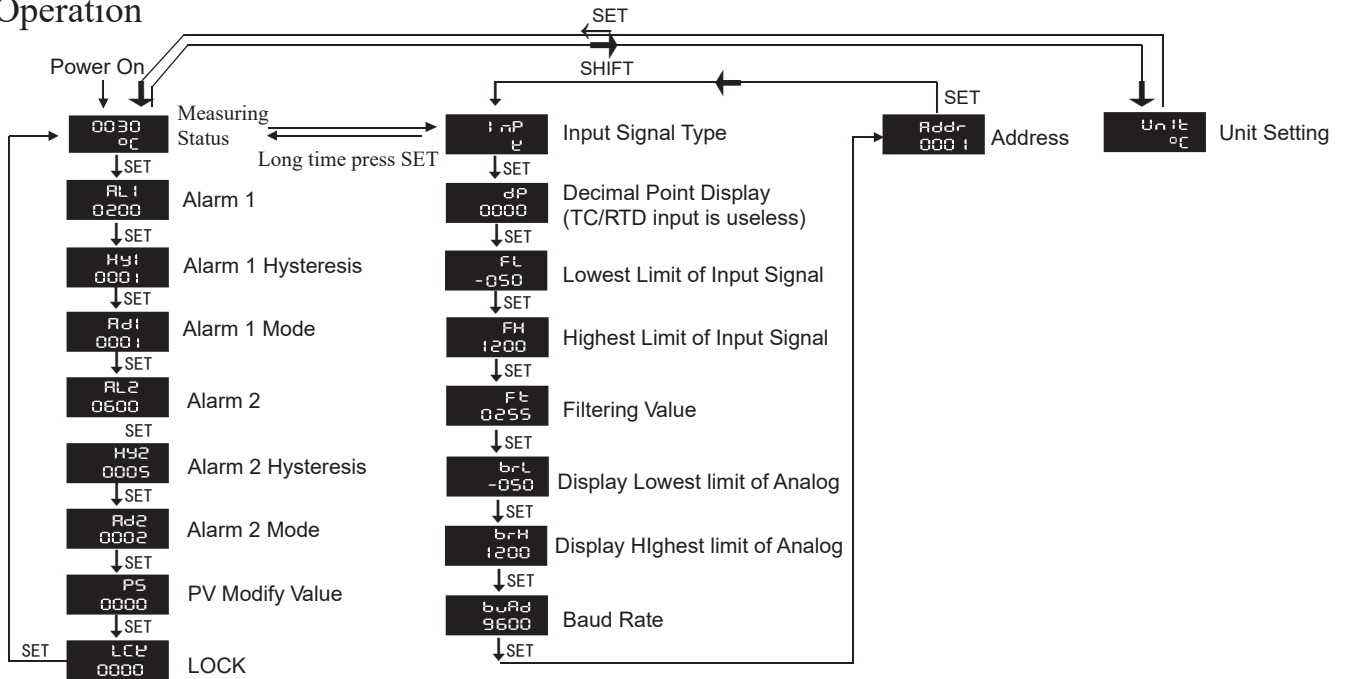
4. Panel Indication



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	Factory Setting
AL1	#1 Alarm Setting Value	FL - FH	200
HY1	#1 Alarm Hysteresis Value	0 - FH	1
Ad1	# 1 Alarm Mode: 1: Absoult Lowest Limit Alarm; 2: Absoult Highest Limit Alarm	1-2	1
AL2	#2 Alarm Setting Value	FL - FH	600
HY2	#2 Alarm Hysteresis Value	0 - FH	5
Ad2	# 2 Alarm Mode: 1: Absoult Lowest Limit Alarm; 2: Absoult Highest Limit Alarm	1-2	2
PS	PV Measuring Value Modify	-1000-1000	0
LCK	LOCK Key: LCK=0001, only modify alarm value; LCK=0010, all the parameters can not be changed (except LCK menu)	0-9999	0

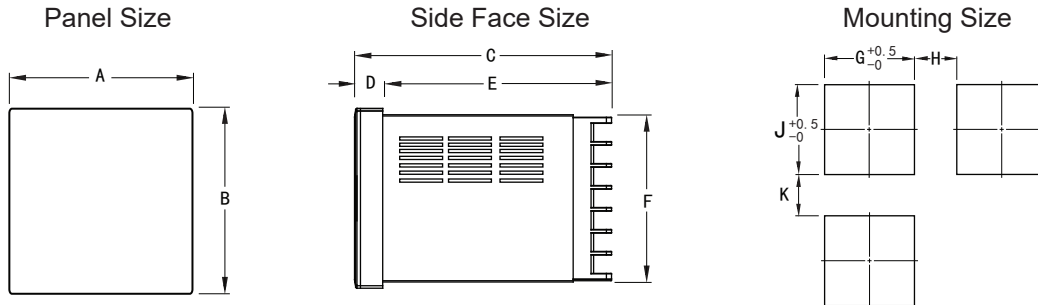
8. High Advanced Menu Setting

Parameter Name	Illustration	Setting Range	Factory Setting
INP	Input Signal Type	Reference Table	K
FL	Input Signal Display Low Limit	Reference Table	-50
FH	Input Signal Display High Limit	Reference Table	1200
dP	Decimal Point Setting (display only for Voltage, Ampere and Resistance signal input)	0-3	0
Ft	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
brL	Display Value for the Analog Low Limit	FL - FH	-50
brH	Display Value for the Analog High Limit	FL - FH	1200
buAd	RS485 Communication Baud Rate	4800, 9600	9600
Addr	RS485 Communication Meter Address	1-255	1
dtC	Data transmission sequence	000, 010	,0

Alarm Function Table

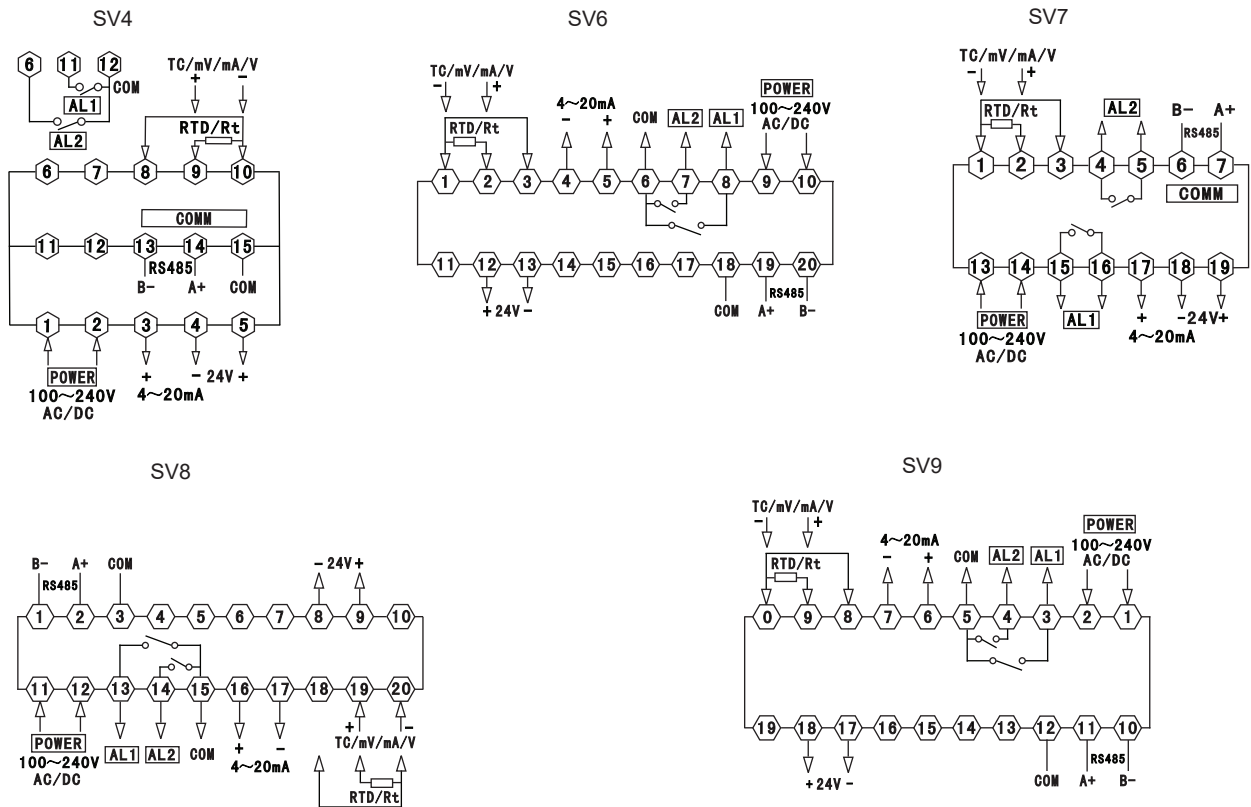
Alarm No	Alarm Type	Alarm Output (AL1, AL2 mutual independence)
1	Absolut Low Limit Alarm	
2	Absolut High Limit Alarm	

9. Dimension and Installation



Model	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	Troubleshooting 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, FL 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.

Exception handling: the CRC error is not returned, the function number error is not returned, if the register address range is not correct, the highest position 1 of the function number is returned, and the setting data range is not detected.

Data Frame Format:

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

1. Read Registers

For example: The host computer read the float number AL1 (the value is 200).

The address code of AL1 is 0x3200, for AL1 is float number (4 bits), it will occupy 2 data registers. Reference IEEE-754 standard the hexadecimal memory code of the decimal floating number 200 is 0x43480000.

Request from the host computer (Read Multiple Registers)							
1	2	3	4	5	6	7	8
Unit Address	Function Code	Start Address High Byte	Start Address Low Byte	Data Length High Byte	Data Length Low Byte	CRC Code Low Byte	CRC Code High Byte
0x01	0x03	0x32	0x00	0x00	0x02	0xCA	0xB3

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 Low Byte	CRC Code High Byte
0x01	0x03	0x04	0x43	0x48	0x00	0x00	0x6F	0xA1

2. Write Registers

Example: The host computer write floating point number al1 (setting value 600)

The address code of AL1 is 0x3200, because AL1 is a floating number (4 bytes) and occupies 2 data registers.

The IEEE-754 standard hexadecimal memory code of decimal floating point number 600 is 0x44160000

Request from the host computer (Write Multiple Registers)												
1	2	3	4	5	6	7	8	9	10	11	12	13
Unit Address	Function Code	Start Address High Byte	Start Address Low Byte	Data Length High Byte	Data Length Low Byte	Data Byte No.	Data 1 High byte	Data 1 Low byte	Data 2 High byte	Data 2 Low byte	CRC Code Low Byte	CRC Code High Byte
0x01	0x10	0x32	0x00	0x00	0x02	0x04	0x44	0x16	0x00	0x00	0x48	0xFA

Correct answer from slave unit (Write Multiple Registers)							
1	2	3	4	5	6	7	8
Unit Address	Function Code	Start Address High Byte	Start Address Low Byte	Data Length High Byte	Data Length Low Byte	CRC Code Low Byte	CRC Code High Byte
0x01	0x10	0x32	0x00	0x00	0x02	0x4F	0x70

SV Series Meter Address Reference Table

No.	Address (Registers number ⑤)	Name	Type	Data Number	Read / Write	Remark
0	0x3000(412289)	Measure Value	float	4	R	
1	0x3002(412291)	Alarm AL1	float	4	R	Note ①
2	0x3004(412293)	Alarm AL2	float	4	R	Note ①
3	0x3100(412545)	Display Low Limit FL	float	4	R/W	
4	0x3102(412547)	Display High Limit FH	float	4	R/W	
5	0x3104(412549)	Input signal type INP	float	4	R/W	Note ②

No.	Address (Registers number ⑤)	Name	Type	Data	Read / Write	Remark
6	0x3106(412551)	Decimal Point DP	float	4	R/W	
7	0x3108(412553)	Unit Setting	float	4	R/W	Note ③
8	0x310A(412555)	Modify Value PS	float	4	R/W	
9	0x310C(412557)	Filtering Setting Value FT	float	4	R/W	
10	0x310E(412559)	Analog Low Limit Value BRL	float	4	R/W	
11	0x3110(412561)	Analog High Limit Value BRH	float	4	R/W	
12	0x3200(412801)	Alarm 1 Value AL1	float	4	R/W	
13	0x3202(412803)	Alarm 1 Hysteresis HY1	float	4	R/W	
14	0x3204(412805)	Alarm 1 Mode AD1	float	4	R/W	Note ①
15	0x3206(412807)	Alarm 2 Value AL2	float	4	R/W	
16	0x3208(412809)	Alarm 2 Hysteresis HY2	float	4	R/W	
17	0x320A(412811)	Alarm 2 Mode AD2	float	4	R/W	Note ①
18	0x3300(413057)	Lock Setting	float	4	R/W	
19	0x3302(413059)	Address ADDR	float	4	R/W	
20	0x3304(413061)	Baud Rate BUAD	float	4	R/W	
21	0x3306(413063)	Menu Shield	float	4	R/W	
22	0x3308(413065)	Data transfer sequence DTC	float	4	R/W	Note ④

Note: the address function is reserved in old version. If the old communication protocol is required for data collection in use, please refer to the instructions of the old version.

R: Read Only R/W: Read / Write
 For Each Parameter's Setting Range, Please Refer to The Operation User Manual

Note① Alarm Mode

Alarm Type	Low Limit Alarm	High Limit Alarm	Alarm Status	ON	OFF
Reference	1	2	Reference	1	0

Note ② : Input Signal (Input parameter meter)
 Note③ : Code and Value reference table (refer to unit code reference table)

Note④: DTC communication data transmission sequence description
 DTC: □ □ □ — Reserve
 — Byte transfer order: When is 0: the transfer order is 1, 2,3,4;
 When is 1: the transfer order is 4,3,2, 1.
 — Reserve

Note ⑤: the register number is composed of converting the address to decimal plus 1, and then adding the register identification code 4 in front; For example, the register number of data address 0x3200 is 12800 + 1 = 12801, and then add 4 in front, that is, the register number 412801; Relevant applications can be seen, such as Siemens S7-200 PLC.

※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;
}

```