SMD SERIES INSTRUCTION MANUAL

- **3½** Digital volt meter & ampere meter
- **4½** Digital volt meter & ampere meter
- **3½** Digital true RMS volt meter & ampere meter
- **3½** & **4½** Analog parameter display meter
- **3½** Digital ohmmeter
- **3½** Digital Thermometer
- **4** Digital power factor meter
- **4/6** Digital counter & length meter
- **4/6** Digital tachometer & line speed meter
- **4/6** Digital timer

Thank you very much for selecting the SMD series digital panel meters, before installing and using, please read the following instructions in detail.

■VOLT&AMPERE METER,OHMMETER, THERMOMETER&ANALOG DISPLAY METER

●MAIN FEATURES

1. 7 Segment LED display, display height 14.2mm.
2. Precise leveling circuit is using to measure AC signal .
3. Power voltage DC 5V（Options:DC7~12V/DC7~24V）
4. Ture RMS series use monolithic true rms-to-dc converter
5. When groups meters use a same DC power supply,can choose power supply and measuring internal isolation model.

●3½ MODEL COMPOSITIONS

SM3D □－□ □－□
① ② ③ ④ ⑤

①NAME---	SM3D	3½ Series digital meter		
②VOLT----		Standard 5VDC power supply		
	H	7-12VDC power supply		
	F	7-24VDC power supply		
③TYPE----	AV	AC Voltage	TDA	AC/DC Ampere
	AA	AC Ampere	SV	Voltage signal
	DV	DC Voltage	SA	Ampere signal
	DA	DC Ampere	SX	appointed signal
	TAV	TRMS AC Voltage	T	Temperature
	TAA	TRMS AC Ampere	R	Ohm signal
	TDV	AC/DC Voltage		
④RANGE--	X	Measurement range		
⑤OTHER--		Standard	H	Hold function
	J	Built-in CT isolation input		
	B	Power and input signal internal isolation model		

●4½ MODEL COMPOSITIONS

SM5D □－□ □－□
① ② ③ ④ ⑤

①NAME----	SM5D	4½ Series digital meter		
②VOLT----		Standard 5VDC Power supply		
	H	7-12VDC power supply		
	F	7-24VDC power suppply		
③ SPEC ---	AV	AC voltage	SV	voltage signal
	AA	AC ampere	SA	ampere signal
	DV	DC voltage	SX	appointed signal
	DA	DC ampere		
④ RANGE--	X	Measuring range		
⑤ OTHER--		Standard	H	Hold function
	J	Built-in CT isolation input		
	B	Power and input signal internal isolation model		

●TECHNICAL REFERENCE

Input mode	Measuring voltage/ampere signal
Power supply	DC5V±5%(Option:7~12VDC/7~30VDC)
Powerconsumption	70mA max.(DC5V Power supply)
DIsplay method	7 Segment LED display
Display range	±1999（**3½**）, ±19999（**4½**）
Sampling Time	Approx. 2.5 times/sec.
Response time	Approx. 2 sec.(0~max.)
A/D converter	Dual slop integral method
Display Accuracy	±0. 2%F.S±2Digit(DC) ±0. 5%F.S±2Digit(AC, Ω, ºC)
Overflow indication	" -1 " or " 1 " (for 3½) " 0000 " flash（for 4½）
Max. allowable input	150% For input F.S
Dielectric resistance	min.100M Ω (at 500VDC)
Insulation strength	AC2000V 50/60Hz for 1 Minute
Ambient humidity	0~50ºC & 35%~85%RH

●DC VOLTMETER

3½ Model	Input F.S	4½ Model	Input F.S
SM3D-DV0.2	±199.9mV	SM5D-DV0.2	±199.99mV
SM3D-DV2	±1.999V	SM5D-DV2	±1.9999V
SM3D-DV20	±19.99V	SM5D-DV20	±19.999V
SM3D-DV200	±199.9V	SM5D-DV200	±199.99V
SM3D-DV600	±600V	SM5D-DV600	±600.0V
SM3D-DV1000	divide volt.	SM5D-DV1000	divide volt.
SM3D-DV2000	divide volt.	SM5D-DV2000	divide volt.
SM3D-DV5000	divide volt.	SM5D-DV5000	divide volt.

*When measure over 1000V,please use divide voltage circuit.
*SM3D-TDV input is the same as SM3D-DV.

●AC VOLTMETER

3½ Model	Input F.S	4½ Model	Input F.S
SM3D-AV0.2	199.9mV	SM5D-AV0.2	199.99mV
SM3D-AV2	1.999V	SM5D-AV2	1.9999V
SM3D-AV20	19.99V	SM5D-AV20	19.999V
SM3D-AV200	199.9V	SM5D-AV200	199.99V
SM3D-AV600	600V	SM5D-AV600	600.0V
SM3D-AV1000	P.T INPUT	SM5D-AV1000	P.T INPUT
SM3D-AV2000	P.T INPUT	SM5D-AV2000	P.T INPUT
SM3D-AV5000	P.T INPUT	SM5D-AV5000	P.T INPUT

*When measure over 1000V, please use a C.T
*SM3D-TAV input is the same as SM3D-AV.

●DC AMMETER

3½ MODEL	INPUT F.S	4½ MODEL	INPUT F.S
SM3D-DA2uA	±1.999uA	SM5D-DA20uA	±19.999uA
SM3D-DA20uA	±19.99uA	SM5D-DA200uA	±199.99uA
SM3D-DA200uA	±199.9uA	SM5D-DA2mA	±1.9999mA
SM3D-DA2mA	±1.999mA	SM5D-DA0.02	±19.999mA
SM3D-DA0.02	±19.99mA	SM5D-DA0.2	±199.99mA
SM3D-DA0.2	±199.9mA	SM5D-DA2	±1.9999A
SM3D-DA2	±1.999A	SM5D-DA5	±5.000A
SM3D-DA5	±5.00A	SM5D-DA10	Shunt 10A/75mV
SM3D-DA10	Shunt 10A/75mV	SM5D-DA20	Shunt 20A/75mV
SM3D-DA20	Shunt 20A/75mV	SM5D-DA30	Shunt 30A/75mV
SM3D-DA30	Shunt 30A/75mV	SM5D-DA50	Shunt 50A/75mV
SM3D-DA50	Shunt 50A/75mV	SM5D-DA100	Shunt 100A/75mV
SM3D-DA100	Shunt 100A/75mV	SM5D-DA200	Shunt 100A/75mV
SM3D-DA200	Shunt 200A/75mV	SM5D-DA500	Shunt 200A/75mV
SM3D-DA1000	Shunt 1000A/75mV	SM5D-DA1000	Shunt 1000A/75mV

*When measure over DC 5A,please use a Shunt(75mV)
*SM3D-TDA input is the same as SM3D-DA.

●AC AMMETER

3½ MODEL	INPUT F.S	4½ MODEL	INPUT F.S
SM3D-AA200uA	199.9uA	SM5D-AA200uA	199.99uA
SM3D-AA0.02	1.999mA	SM5D-AA2mA	1.9999mA
SM3D-AA2mA	19.99mA	SM5D-AA0.02	19.999mA
SM3D-AA0.2	199.9mA	SM5D-AA0.2	199.99mA
SM3D-AA2	1.999A	SM5D-AA2	1.9999A
SM3D-AA5	5.00A	SM5D-AA5	5.000A
SM3D-AA20	C.T20A/5A	SM5D-AA20	C.T20A/5A
SM3D-AA30	C.T30A/5A	SM5D-AA30	C.T30A/5A
SM3D-AA50	C.T50A/5A	SM5D-AA50	C.T50A/5A
SM3D-AA100	C.T100A/5A	SM5D-AA100	C.T100A/5A
SM3D-AA200	C.T200A/5A	SM5D-AA200	C.T200A/5A
SM3D-AA1000	C.T1000A/5A	SM5D-AA1000	C.T1000A/5A

*When measure over AC 5A, please use a C.T or Shunt
*SM3D-TAA input is the same as SM3D-AA

●BUILT-IN PRECISE C.T AC AMPERE METER

Model	Range	C.Tholediameter	Crossing turns
SM3D-AA20-J	0~19.99A	7mm	1
SM5D-AA20-J	0~19.999A		
SM3D-AA5-J	0~5.00A	5mm	1
SM5D-AA5-J	0~5.000A		
SM3D-AA2-J	0~1.999A	5mm	2
SM5D-AA2-J	0~1.9999A		

* Please put the tested cable through the C.T hole,The meter will display the ampere , the meter was isolated with the circuit completely, SM3D-AA2-J and SM5D- AA2-J need to entwine the C.T hole 2 times.

●DIGITAL THERMOMETER

Model	Range	Temperature sensor
SM3D-TK1	0~200ºC	K Thermocouple
SM3D-TK2	0~400ºC	
SM3D-TK3	0~800ºC	
SM3D-TK4	0~1200ºC	
SM3D-TP1	-100.0~199.9ºC	Pt100
SM3D-TP2	-200~500ºC	

*Thermocouple cold compensation range :0~50ºC

●DIGITAL OHMMETER

Model	Range	Test current
SM3D-R20	0~19.99 Ω	10mA
SM3D-R200	0~199.9 Ω	10mA
SM3D-R2K	0~1.999K Ω	1mA
SM3D-R20K	0~19.99K Ω	100uA
SM3D-R200K	0~199.9K Ω	10uA
SM3D-R2M	0~1.999M Ω	1uA
SM3D-R10M	0~10.00M Ω	0.1uA

* For SM3D-R20 and SM3D-R200,please pay attention to the connecting resistance influence to the measuring accuracy .

●PARAMETER DISPLAY METER

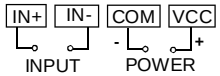
Measuring various linear voltage,ampere,ohm signal,display frequency,rotative speed,line speed,weight ,temperature, humidity,power,flow,length,percentage etc.

Model	Input range	Display range
SM3D-SV5	DC1~5V	0~±1999 the decimal point position can be set freely
SM3D-SV10	DC0~10V	
SM3D-SA0.01	DC0-10mA	
SM3D-SA0.02	DC4~20mA	
SM3D-SX	Appointed signal	
SM5D-SV5	DC1~5V	0~±19999 the decimal point position can be set freely
SM5D-SV10	DC0~10V	
SM5D-SA0.01	DC0-10mA	
SM5D-SA0.02	DC4~20mA	
SM5D-SX	Appointed signal	

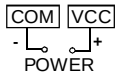
* Please indicate the input range ,and the corresponding display range information.

●CONNECTIONS

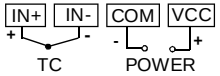
• Voltage/Ampere/Resistance input



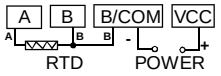
• Built-in C.T meter



• K thermocouple input



• PT100 input



∗ if the connection drawing doesn't correspond to the drawing on the product, please according to the drawing on the product.

●CAUTIONS

1. Isolating the DC power supply when the non-isolation voltmeter and the ampere meter use together , prohibited to use a same DC power source or two non-isolation DC power supply, otherwise possible to damage the meter.
2. Groups non-isolation voltmeters can use a same DC power supply, eliminating the input signal and power source's potential difference as far as possible to avoid display unstable, groups non-isolation ampere meters can not use a same DC power supply.
3. Before turning on the meter's power source, please first check the power source's polarity and the voltage to avoid damage to the meter.
4. Input signals cable should not too long, better to use twisted-pair shielded cable; to avoid interfere head stream, installing high frequency filtration electric capacity .

■COUNTER&TIMER&FREQUENCY TACHO&LINE SPEED METERS

●MAIN FEATURES

1. NPN and PNP signal input channel.
2. The length meter and the line speed meter can set prescale value and decimal point position.
3. Counting speed can choose 30Hz/2000Hz .
4. Frequency&tacho meter max. input rate 10KHz (high type 100KHz).
5. Timer can choose various time range and time method .
6. EEPROM Automatic data storage when power off (option item) .
7. Power voltage DC 5V (Options:DC7~12V/DC7~24V)

●COUNTER/LENGTH METER COMPOSITIONS

SM4D □−□ □
① ② ③ ④

①NAME---	SM4D	4 Digit series digital meter		
	SM6D	6 Digit series digital meter		
②VOLT----		Standard DC 5V power supply		
	H	DC 7-12V power supply		
	F	DC 7-24V power supply		
③TYPE----	C1	Count function	L1	Length function
	C2	With memory	L2	With memory
	C3	Up/down count	L3	Up/down length
④ INPUT---		NPN signal input		
	P	PNP signal input		

●TIMER COMPOSITIONS

SM4D □−□ □
① ② ③ ④

①NAME----	SM4D	4 Digit series digital meter
	SM6D	6 Digit series digital meter
②VOLT----		Standard DC 5V power supply
	H	DC 7-12V power supply
	F	DC 7-24V power supply
③TYPE----	T1	Basic function
	T2	With Memory function
④ INPUT---		NPN signal input
	P	PNP signal input

●TACHO/LINE SPEED/FREQUENCY METER

SM4D □−□ □−□
① ② ③ ④ ⑤

①NAME----	SM4D	4 Digit series digital meter
	SM6D	6 Digit series digital meter
②VOLT----		Standard DC 5V power supply
	H	DC 7-12V power supply
	F	DC 7-24V power supply
③TYPE----	RF	Tacho&Frequency
	LS	Line speed
	HZ	AC Power Frequency
④ INPUT---		NPN signal input
	P	PNP signal input
⑤OTHERS-		Standard Model
	H	High Frequency Model

●TECHNICAL PARAMETER

Input mode	Test various impulse signal
Power supply	DC5V±5%(Option:7~12VDC/7~30VDC)
Powerconsumption	70mA max.(DC5V Power supply)
DIsplay method	4 digit display:14.2mm,6 digit:10mm
Display range	9999 (4Digit) , 999999 (6Digit)
Input level	With voltage input(PNP)and no- voltage input(NPN) [Voltage input] Low:0~2V,high:5~30V Input impedance:5K Ω [No-voltage input] Short circuit impedance:≤1K Ω Residual voltage≤2V Open circuit impedance≥100K Ω
Display accuracy	±0.1% rdg±2digit (only for speed meter)
Timer Accuracy	Max. ±0.02%±0.05S (only for timer)
Reset input	Counter/Timer reset with external singals input
Overflow indication	When measure overflow display:----or------
Memory function	E^2PROM Automatic data storage when power off
Dielectric resistance	min.100M Ω (at 500VDC)
Insulation strength	AC2000V 50/60Hz for 1 Minute
Ambient humidity	0~50ºC & 35%~85%RH

●COUNTER&LENGTEH METER SETTING

• **FUN1 : set Max. counting speed**

FUN1	ON(Short circuit insert)	OFF(no-Short circuit insert)
1	Max. speed 30Hz	Max. speed 2KHz

∗ Contact signal input must select ON

• **FUN2&FUN3 : set decimal point(only for length meter)**

FUN2	FUN3	Function
ON	ON	no-decimal point
OFF	ON	1 decimal point
ON	OFF	2 decimal point
OFF	OFF	3 decimal point

∗ ON:Short circuit insert,OFF:no-Short circuit insert

• **Set prescale value 0.001~9999(only for length meter)**

Press MD key for 2 seconds,enter into prescale value setting:the decimal point start flickering,Touch MD key,move the decimal point position,Touch SET key, change the setting value.first set prescale value,then set decimal point position.when the setting finish,Press MD key for over 2 Sec. prescale value will be save in E^2PROM automaticly.and return to run.

●TIMER FUNCTIONS SETTING

• **FUN1:set time mode**

FUN1 ON(Short circuit insert): measure the time form power on or control signal on.

FUN1 OFF(no-Short circuit insert): It doesn't displays the time when power on. measure the time of control signal on, without control signal keeps the time value, and the next control signal on. the time reset and measure again.

• **FUN2&FUN3 : Set time range**

FUN2	FUN3	4 Digit timer	6 Digit timer
ON	ON	99.99s	99m59.99s
OFF	ON	99m59s	99h59m59s
ON	OFF	99h59m	9999h59m
OFF	OFF	9999h	99999.9h

∗ ON:Short circuit insert,OFF:no-Short circuit insert

●TACHO/LINE SPEED METER SETTING

• **FUN2& FUN3**

FUN	ON(Short circuit insert)	OFF(no-Short circuit insert)
FUN1	Input frequency min.1Hz (the display responds quickly)	Input frequency min.0.1Hz (the display responds slowly)
FUN2	Measuring revolving speed(RPM)	Measuring frequency(Hz)

• **FUN3&FUN4 : set decimal point**

FUN3	FUN4	Function
ON	ON	No decimal point
OFF	ON	1 decimal point
ON	OFF	2 decimal point
OFF	OFF	3 decimal point

∗ ON:Short circuit insert,OFF:no-Short circuit insert

• **Set prescale value 0.001~9999(only for line speed meter)**

Setting method is the same as the length meter's settings method, please refer to above.

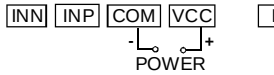
●AC POWER FREQUENCY METER FUNCTIONS

AC power frequency meter input voltage 60~300V, and measure power frequency: 0~9999Hz, The meter based on input signal adjust the decimal point position automaticly.

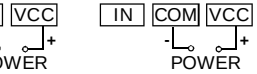
●CONNECTIONS

• Counter/Length meter/Timer input connections

• Tacho/line speed meter input

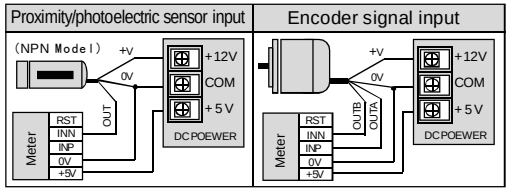


• Power frequency meter input



∗INP:voltage signal input (PNP) ; INN:non-voltage signal input (NPN) ; RST:Reset signal input (The low level is effective). When counts up/down, INP and INN are the phase difference inputs , and the signal input options: PNP or NPN signal.

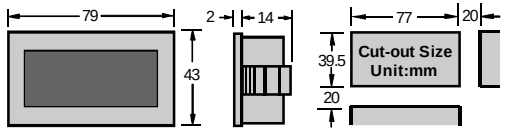
●CONNECTION SAMPLES



●CAUTIONS

•Before turning on the meter's power source, please first inspect the power source's polarity and the voltage to avoid damage to the meter.
•Shidel line much be used when the measuring input line is getting longer or there lots of noises
•please use separated line form high voltage line or power line in order to avoid inductive noises.
•Prevent from violent vibration,shock and cover of heavy dust.

■ DIMENSIONS



∗ The meter's actual length surpasses the outer covering length, different models has different length.