ES921 Three Phase Intelligent Power Meter Use's Manual

Model

ES92 □-□
- Input Signal：3V:Voltage Measure 3A:Ampere Measure P:Voltage, Ampere, Power
- Display: 1:Digital Display
- Size: 9:96H×96W×61.5L（mm）
- Series：ES Series Three Phase Intelligent Power Meter

This series meters are widely applied to control system, SCADA system and energy management system, transformer substation automation, distributing net automation, residence community electrical power monitor, industrial automation, intelligent construction, intelligent switchboard, switch cabinet, etc. It is easy to install and maintain, simple connection, programmable setting parameters on meters or computer.

Model Indication

Model	ON-OFF Input	On-OFF Output	Communication	Function Measure
ES921-P	2	2	1 loop	Voltage,Ampere,Power
ES921-3A	2	2	1 loop	Alternating Current
ES921-3V	2	2	1 loop	Univoltage

Features:

- ⊙Measuring Items:Voltage/Current/Active Power/Reactive Power/Frequency/ Power Factor
- ⊙Two switch input and two switch output, with remote control function
- ⊙Input and output buffering
- ⊙True effective value measurement
- ⊙With RS485 interface/Modbus RTU communication protocol
- ⊙With two switch programmable alarm
- ⊙Display programming sets input parameters

⚠ Warining:

1. An accident may happen and product may be damaged if the operation does not comply with the instruction.
2. The information provided in this manual can be modified without prior notice.
3. The company reserves the right to interpret the said information.

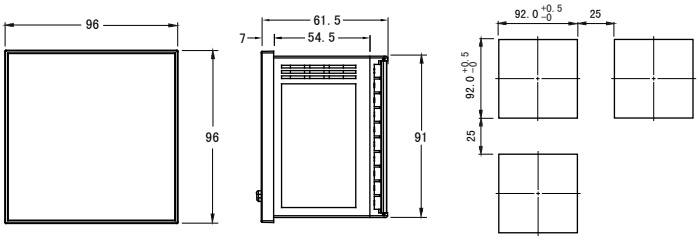
Main Technical Parameters

Connection	3 Phase 3 Wires、3 Phase 4 Wires
Voltage Range	AC 3 ×220V/380V（3x57.7V/100V）
Voltage Overload	Continuous:1.2times Instantaneous:2times/2S
Voltage Consumption	<0.5VA (each Phase)
Voltage impedance	≥300KΩ
Voltage accuracy	RMS measurement accurancy class 0.5
Current range	AC 0.025 ～ 5A
Current Overload	Continuous:1.2times Instantaneous:10times/2S
Current Consumption	<0.5VA (each phase)
Current impedance	〈20m Ω
Current accuracy	RMS measurement accurancy class 0.5
Freqency	45～60Hz accuracy 0.01Hz
Power	Active/Reactive/Apparent Power, Accuracy Class 0.5
Display	LCD light display
Power Supply	AC/DC 100 ～240V （85 ～265V）
Current Consumption	≤ 5VA
Switch Output	RS-485, MODBUS-RTU Protocol
Alarm Output	2 switch output, AC250V/3A or DC30V/5A
Working environment	Temperature：-10 -50 ℃ Humidity:＜85% Non-corrosive Gas;altitude≤2500m
Storage environment	-40 ～70 ℃

KKES921-B01C-20170830

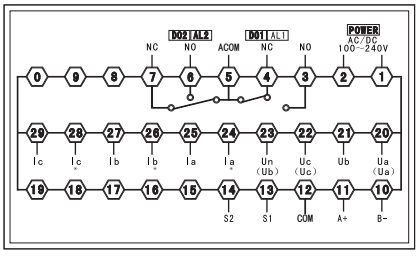
Isolation withstand voltage	Current and 485 connection, DIconnection≥DC 2000V
Insulation	Input,output, power pair casing＞5MΩ
Size	96H×96W×61.5L（mm）
Weight	0.5kg

Shape and mounting hole size (mm)



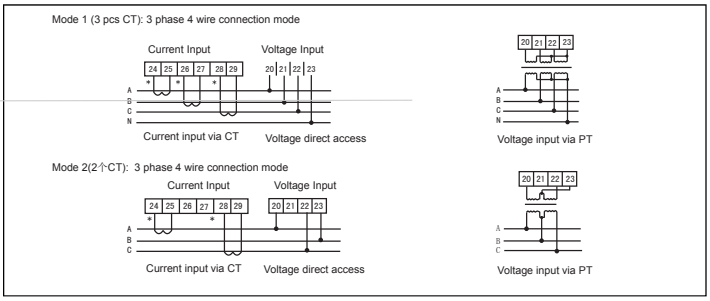
Panel Size　　Side-face size　　Mounting siz

Connection Drawing



The wiring diagram is based on the real case

Note: Please suject to the connection drawing on the controller in any changes.



Explanation:

A.Voltage input：Input voltage should not be higher than the rated input voltage of meter，otherwise a PT should be used.

B.Current input：Standard rated input current is 5A. A CT should be used when the input current is bigger than 5A. If some other meters are connected with the same CT, the connection should be serial for all meters..

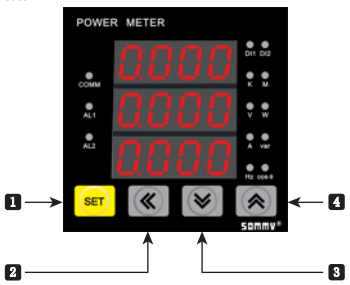
C.Please make sure that the input voltage is corresponding to the input current, they should have the same phase sequence and direction,otherwise data and sign error may occur .

D.The connection mode of meter which is connected to power network should depend on the CT quantity. For 2pcs of CT，it should be 3 phase 3 wire connection two element mode. For 3 pcs of CT，it should be 3 phase 3 wire connection two element mode.Meter wire connection, the input network Link setting in the software menu should accord to the connection mode of the measured load. Otherwise, the measured voltage or power is incorrect.

Caution:

1. Power supply connection must be correct.
2. Pay attention on the phase sequence of voltage singal input.
3. Current signal input should be connected as per the connection drawing.
4. Connection mode should accord to the setting of user menu "LIN".
5. Isolation between power supply and circuid board, in cause of leakage switch wrong action

Panel Indicate



Symbol	Function
DI1	Switch 1 input indicate
DI2	Switch 2 input indicate
K	1000 unit indicator light
M	unit indicator light
V	DC display
W	Active power display
A	Current displsy
Var	Reactive power display
Hz	Frequency dispaly
cos Ø	Power factor display
COMM	Communication light
AL1	Alarm 1 indicate light
AL2	Alarm 2 indicate light

Item	Symbol	Name	Function
1	SET	Set Key	Press this key to 3s to enter the menu; TO confirm the modified menu value
2	«	Left Key	Shift menu and move data postion in menu operation
3	»	Decrease Key	Enter data modification in menu operation; Decrease the data
4	»	Increase Key	Enter data modification in menu operation; Increase the data

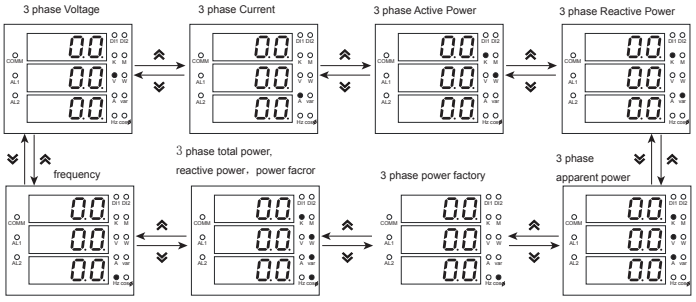
Measuring display Indication:

1.Under the measure status in 3 phas 4 wire, press " » / » key to switch display 3 phase phase voltage, 3 phase line voltage, 3 phase current, 3 phase active power, 3 phase reactive power, 3 phase power factor, total power, frequency, etc.
2.DO1，DO2 a. Under Alarm Mode: used as alarm output status indicate; b.Under switch remote control model: used as switch output status indicate;
3.COM flashing means communicate is acting.

Note：The representation of 26 English letters with digital tube：

English Letters	A	B	C	D	E	F	G	H	I	J	K	L	M
Digital tube display method	A	b	C	d	E	F	G	H	I	J	K	L	M
English Letters	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Digital tube display method	n	o	P	q	r	S	t	U	v	W	X	Y	Z

Description of measurement interface switching process:



（Note: In three-phase three wire measurement state, only"three phase line voltage""total active power, reactive power,and total power factor""frequency"is displayed.

七、Menu modification instructions

Measurement Status

1. Under the 3 phase 4 wire,press" »"or" »"key, it can display 3 phase voltage, 3 phase current, 3 phase active power, 3 phase reactive power, 3 phase power factor, 3 phase total power reactive power factor, frequency.
2. Under 3 phase 4 line, press the confirmation key "SET",Under the three-phase four wire, according to the confirmation key "SET", the voltage display value is switched between the phase voltage and the line voltage, and only the line voltage is displayed under the three-phase three line.
3. Press the confirmation key "SET" for more than 5 seconds, enter the user menu, and see the menu structure in the operation process.

Under menu state

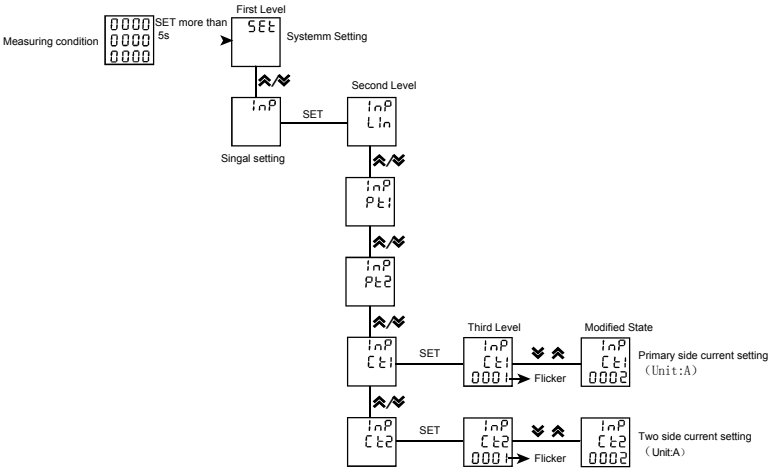
1.If the current is first or 2 level display, press the confirmation key "SET" to enter the next level display. Crawling " » "," » ", to change the menu item or menu subkey.
2.If the current is second or third level display, crawling " « ",return to previous level display.
3.If the current is third level display, crawling " » » ",the value starts flashing, control" » "," » "to modify, press " « " to flicker shift and press the confirmation key " SET " to save setting.
4、After the modification, press the confirmation key "SET" for more than 5 seconds, exit the user menu, enter the measurement state, or press "step by step" to exit the menu.

Menu structure and function description (Note: the decimal point of the parameter in the menu is fixed decimal point)

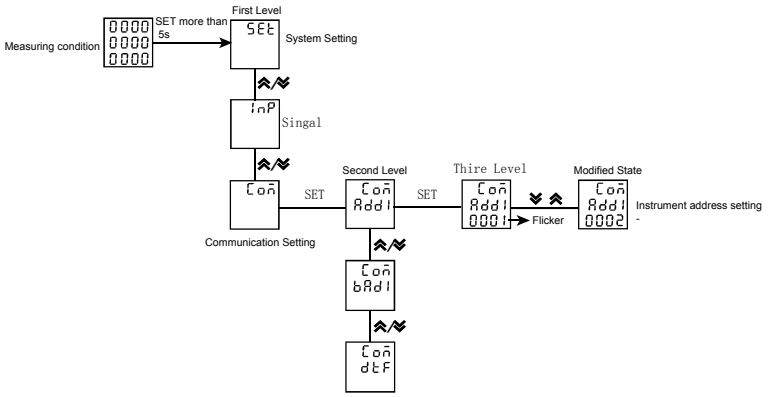
1st level	2nd level	3rd level		Description
System Setting SEt	Clear Energy	CLrE	0000	When input 1111, user can clear energy; When input 1234, the menu can be reset to default setting.
	User Passward	USEr	0000	Modity the password, factory default setting 0000, no passward.
	Page Turning Time	PGCH	0000	Backlight lighting delay time, unit "second". When value is "0" , it will keep on lighting all the time
	Software Release	VEr	1.1	Software version, read only
Singal Setting InP	Network	Lin	3-3 / 3-4	Set power net input mode, 3 phase 3 wire or 3 phase 4 wire
	Voltage transform	Pt1	0.1-999.9	Primary voltage, unit KV
	Voltage transform	Pt2	10.0-999.9	Secondary voltage, unit KV
	Current Ratio	Ct1	1-9999	Primary current, unit A
	Current Ratio	Ct2	1.0-999.9	Secondary current, unit A
Communication Setting Con	Address	Add	1-247	Meter address range
	Baud Rate	brd	1k2/2k4/4k8/9k6	Baud Rate 1k2 means 1200, 2k4 means 2400, 4k8 means 4800, 9k6 means 9600
	Data Sequence	dtF	H-L / L-H	High register is in front or low register is in front
	Check bit	PrtY	no/EVEn/odd	Non-check in/ even-check in/ uneven-check in
Alarm Setting AL	Alarm mode	Ad1	0-58	When value is DO, it is remote control mode, otherwise it is alarm mode, please refer to Table 1 as below
	Alarm value unit	Ut1	1/K/M	1: means international standard unit, K: 1000 times of international standard unit, M: 1000000 times of international standard unit.
	Alarm value	AL1	0-999.9	1st alarm value setting (unit is standard display unit)
	Alarm back difference	HY1	0-999.9	First way alarm back difference setting
	Alarm relay selection	oUt1	rLY1/rLY2	Selection of first way alarm relay output
	Alarm delay time	dLA1	0-99.9	Alarm action delay time, unit: second
	Alarm reset time	dLb1	0-99.9	Alarm action reset time, unit: second
	Second way alarm related parameter setting method refer to the first road			

Note:Example of menu modification

Ex 1, setting current method



EX 2, Method of setting up communication address



■ Output function

1. Two way DO1, DO2 function can be used for "remote control" electrical equipment; the use of this function, the alarm mode should be selected "0" (DO), otherwise DO1, DO2 will as alarm AL1, AL2 output; DO1, DO2 function control quantity through the RS485 interface to write.
2. Communication function (communication protocol to the company's official website: www.sommy.com.cn download or to the Technical Services Department of the company)
3. Alarm function, after the instrument power, stable operation is more than 5 seconds, the alarm began to operate (see table below)

Alarm output power parameter comparison table

No.	Item	Switch output (low alarm) code	Switch output (high alarm) code
1	Ua(A phase voltage)	1 (UaL)	2 (UaH)
2	Ub(B phase voltage)	3 (UbL)	4 (UbH)
3	Uc(C phase voltage)	5 (UcL)	6 (UcH)
4	U(A、B、C any phase voltage)	7 (UL)	8 (UH)
5	Uab(AB line voltage)	9 (UabL)	10 (UabH)
6	Uca(CA line voltage)	11 (UcaL)	12 (UcaH)
7	Ubc(BC line voltage)	13 (UbcL)	14 (UbcH)
8	UL(AB、BC、CA any line voltage)	15 (ULL)	16 (ULH)
9	Ia(A line current)	17 (IaL)	18 (IaH)
10	Ib(B line current)	19 (IbL)	20 (IbH)
11	Ic(C line current)	21 (IcL)	22 (IcH)
12	I(A、B、C any line current)	23 (IL)	24 (IH)
13	P(Total active power)	25 (PL)	26 (PH)
14	Pa(A phase active power)	27 (PaL)	28 (PaH)
15	Pb (B phase active power)	29 (PbL)	30 (PbH)
16	Pc(C phase active power)	31 (PcL)	32 (PcH)
17	Q(Total reactive power)	33 (QL)	34 (QH)
18	Qa (A phase reactive power)	35 (QaL)	36 (QaH)
19	Qb(B phase reactive power)	37 (QbL)	38 (QbH)
20	Qc(C phase reactive power	39 (QcL)	40 (QcH)
21	S(Total apparent power)	41 (SL)	42 (SH)
22	Sa(A phase apparent power)	43 (SaL)	44 (SaH)
23	Sb(B phase apparent power)	45 (SbL)	46 (SbH)
24	Sc(C phase apparent power)	47 (ScL)	48 (ScH)
25	PF(Total power factor)	49 (PFLL)	50 (PFLH)
26	PFa (A phase power factor)	51 (PFaL)	52 (PFaH)
27	PFb(B phase power factor)	53 (PFbL)	54 (PFbH)
28	PFc(C phase power factor)	55 (PFcL)	56 (PFcH)
29	F Frequency	57 (FL)	58 (FH)