3 Phase Intelligent Power Meter User' Manual

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.

Features:

◎Measuring Items: 3 phase Voltage/Current/Active Power/Reactive Power/Frequency/Power Factor etc, totally 28 parameters
◎Two switch input.
◎True effective value measurement
◎With RS485 interface，Modbus RTU communication protocol
◎With the function of positive active power and reverse active power recording, the functions of consumption and emit can be recorded.

⚠ Warning An accident may happen and product may be damaged if the operation does not comply with the instruction

KKES725C01-A/1-20170920

■ Model

E S 7 2 5 - □
- Type of Measurement: W: 3 phase comprehensive measurement type
- Display Mode: 5: Segment code liquid crystal display
- Style: 2: short shell
- Size: 7: 72H x 72W x 72.5L (mm)
- ES Series 3 Phase Power Meter

■ Model Indication

Model	Communication	Switch input or output
ES725-W	RS485	2

■ Technical Parameters

Connection	3 phase 3 wires, 3 phase 4 wires
Voltage range	AC 3×220V/380V（3x57.7V/100V）
Voltage overload	Continuous: 1.2 times Instantaneous: 2 times/2S
Voltage Consumption	<1VA (each phase)
Voltage impedance	≥300KΩ
Voltage accuracy	RMS measurement, accuracy class 0.5
Current range	AC 0.025～5A
Current overload	Continuous: 1.2 times Instantaneous: 10 times/2S
Current consumption	<0.4VA (each phase)
Current impedance	<20mΩ
Current accuracy	RMS measurement, accuracy class 0.5
Freqency	45～60Hz, accurancy 0.01Hz
Power	Active / Reactive / Apparent power, accuracy 0.5 class
Energy	Active Energy 1 class, Reactive Energy 2 class
Display	LCD Display
Power supply	AC/DC 100～240V（85～265V）
Power supply consumption	≤5VA
Output digital interface	RS-485, MODBUS-RTU Protocol
Alarm output	2 switch output, 250VAC/3A or 30VDC/5A
Working environment	Temperature: -10~50℃ Humidity:<85% RH; Non-corrosive Gas; altitude ≤2500m
Storage environment	-40～70℃

With stand voltage	Current and RS485 interface, DI interface≥DC 2000V
Isolation	Input, Output, Power Pair Casing > 5MΩ
Size	72 W×72H×72.5L（mm）
Weight	0.5kg

■ Dimension(mm)

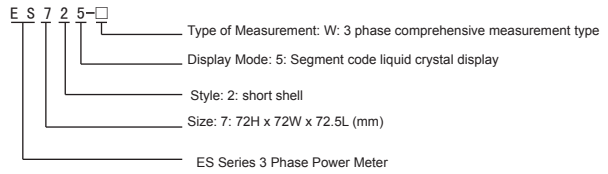Panel Size   Side Face Size   Mounting Size
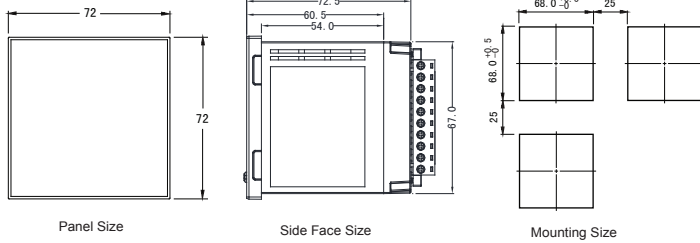
■ Connection Drawing
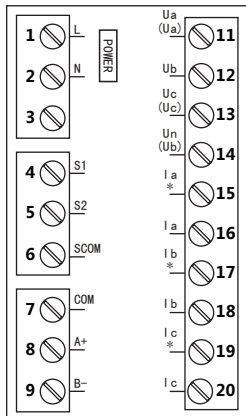
Please take the object as the object of the electrogram

Note: The wire input terminal, the brackets brackets indicate that the three-phase three wire extension and wiring are subject to change, please to factory instrument wiring shall prevail.
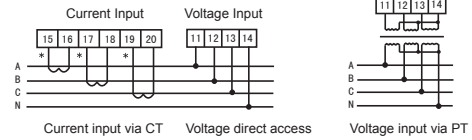
Mode 1 (3 pcs CT): 3 phase 4 wire connection mode

Current input via CT   Voltage direct access   Voltage input via PT

Mode 2（2 pcs CT）: 3 phase 3 wires connection mode(only for electric energy measurement)

Current input via CT   Voltage direct access   Voltage input via PT
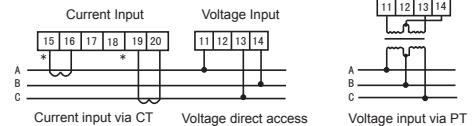
Explanation:
1Voltage input: Input voltage should not be higher than the rated input voltage of meter，otherwise a PT should be used.
2.Current input: Standard rated input current is 5A. A CT should be used when the input current is bigger than 5A. If some other meters are connected with the same CT, the connection should be serial for all meters.
3.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.
4.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.
5.Please pay attention to the difference between the 3 phase 4 wires and 3 phase 3 wires connection mode. If the connection error will result in the power factor, the power and power are not measured correctly.
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 Indication
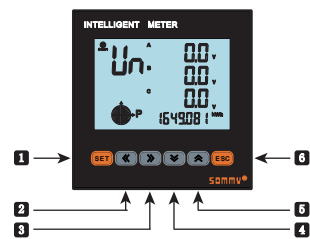
| Item	Symbol	Name	Function	
1	SET	Set Key	△Press this key for 5s to enter the menu	△To confirm the modified menu value
2	«	Left Key	△Shift menu and move data postion in menu operation	△To shift measure interface outside of the menu
3	»	Right Key	△Shift menu and move data postion in menu operation	△To shift measure interface outside of the menu
4	∨	Decrease Key	△Enter data modification in menu operation	△To shift energy page outside of the menu
5	∧	Increase Key	△Enter data modification in menu operation	△To shift energy page outside of the menu
6	ESC	Return Key	△For backspace in menu operation	△Back to previous menu

Measuring display Indication:

1. Under the measure status, press "≪ /≫ " key to 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. Press the increasing key and decreasing key " ⋀ /⋁ "to switch Total active power (algebra and), positive active power, reverse active power, total reactive power (algebra and), positive reactive power, reverse reactive power conversion display.

3. COM flashing indicates a communication

4. P (kWh) represents the total active power (the algebraic sum of the positive active energy and the reverse active electric energy). Q (kvarh) represents the total reactive power (the algebraic sum of the positive reactive power and the reverse reactive power).
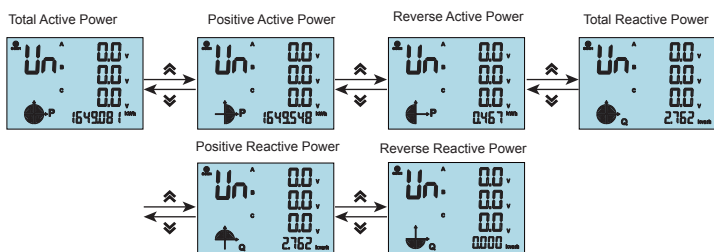
Note: The representation of 26 English letters with digital tube:

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	n̄
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	u	u̇	ü	y	=

Description of measurement interface switching process:
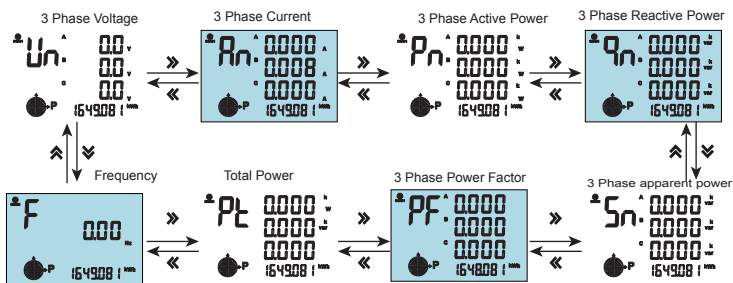
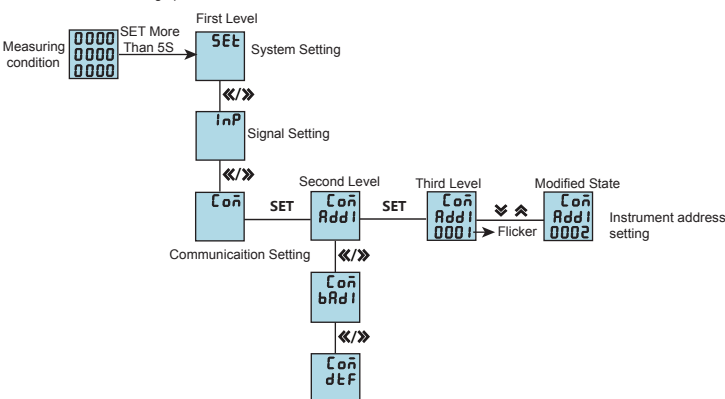**An example of an electrical energy interface switching process**
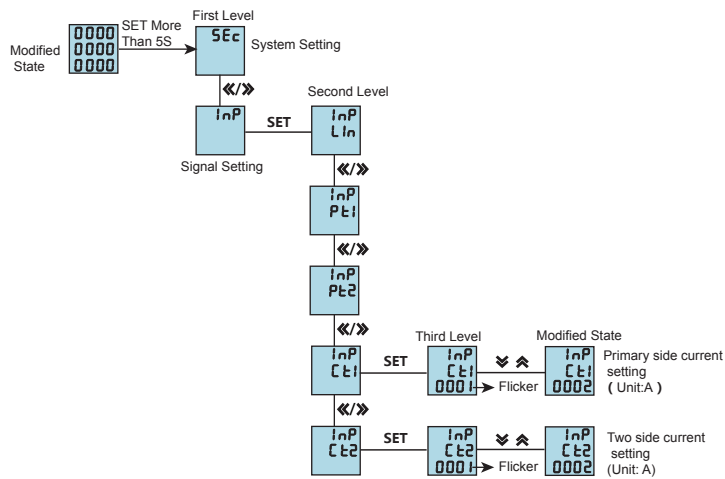
Menu modification instructions

Under menu state

1. If the SET key is greater than 5 seconds, if the user set the password, it will enter the password input box, enter the correct password into the user menu, and modify the corresponding parameters.

2. If the current is first level display, press the confirmation key" SET "to enter the the next level display. Crawling"≫ "to change ≪ menu item or menu subkey.

3.If the current is second or third level display, crawing the ESC key, return to the upper level display.

4.If the current is third level display, crawing" ⋁ ⋀ the value starts flashing, press the " ≪≫ to move, and crawling the ⋀⋁ key to adjust the value, press the SET key to save setting when flicker. If press "ESC "key, it does not save the value and return to the second level.

5.- 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

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	Modify the password, factory default setting 0000, no password
	Backlight	bLt	0000	The delay time of the backlight is extinguished, the unit is second, and the value is zero.
	Page Turning Time	PGtH	0000	Backlight lighting delay time, unit "second". When value is "0", Page Turning Time it will keep on lighting all the time
	Software Release	uEr	1.1	Software version, read only
Signal 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
Signal Setting **Con**	Address	Add1	1-247	Meter address range
	Baud Rate	brd1	1k2/2k4/ 4k8/9k6	Baud Rate 1k2 means 1200, 2k4 means 2400, 4k8 means 4800, 9k6 means 9600
	Data Sequence	dtF1	H-L / L-H	High register is in front or low register is in front
Alarm Setting **AL**	Alarm	Ad1	1-66	When value is DO, it is remote control mode, otherwise it is alarm mode, please refer to Table 1 as below
	Alarm 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 Action	AL1	0-999.9	1st alarm value setting (unit is standard display unit)
	Alarm return difference	HY1	0-999.9	First way alarm back difference setting
	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,: Manu Modified Example

Ex1: Method of setting current ratio

EX 2, Method of setting up communication address

Output Function (Reference when selecting alarm function)

1. Communication Function(Communication Portocal, please download in the websize:www.sommy.com.cn)。

2. Alarm output.after the meter is on, it runs steadily for more than 5s and the alarm starts to operate (see form 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	Ubc(BC line voltage)	11 (UbcL)	12 (UbcH)
7	Uca(CA line vo;tage)	13 (UcaL)	14 (UcaH)
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 phase current)	23 (IL)	24 (IH)
13	Pa(A phase active power)	25 (PaL)	26 (PaH)
14	Pb(B phase active power)	27 (PbL)	28 (PbH)
15	Pc(C phase active power)	29 (PcL)	30 (PcH)
16	P(Total Active Power)	31 (PL)	32 (PH)
17	Qa(A phase reactive power)	33 (QaL)	34 (QaH)
18	Qb(B phase reactive power)	35 (QbL)	36 (QbH)
19	Qc(C phase reactive power)	37 (QcL)	38 (QcH)
20	Q(Total Reactive Power)	39 (QL)	40 (QH)
21	Sa(A phase apparent power))	41 (SaL)	42 (SaH)
22	Sb(B phase apparent power)	43 (SbL)	44 (SbH)
23	Sc(C phase apparent power)	45 (ScL)	46 (ScH)
24	S(Total apparent power)	47 (SL)	48 (SH)
25	PFa(A phase Power Factor)	49 (PFaL)	50 (PFaH)
26	PFb(B phase Power Factor)	51 (PFbL)	52 (PFbH)
27	PFc(C phase Power Factor)	53 (PFcL)	54 (PFcH)
28	PF(Total Power Factor)	55 (PFLL)	56 (PFLH)
29	F (Frequency)	57 (FL)	58 (FH)
30	EP(Total Active Power)	59 (EPL)	60 (EPH)
31	EQ(Total Reactive Power)	61 (EQL)	62 (EQH)
32	Unbalance Difference	63 (UNNB)	64 (ULNB)
33	Unbalance Difference·	65 (INNB)	66 (PNNB)