

3 Phase 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, small district electrical power monitor, industrial automation, intelligent construction, intelligent switchboard, switch cabinet, etc. It is easy to install and maintain, simple connection, field programmable setting input parameters.

Features:

- Measuring parameters: voltage/current/active power/reactive power/frequency/power factor, etc.
- 2 loop DI and 2 loop DO, with remote signalling and telecommand function.
- Isolated input and output.
- True RMS measurement.
- With RS485 communication port, and ModBus RTD protocol.
- With 2loop programmable alarm.
- Display programmable setting input parameters.

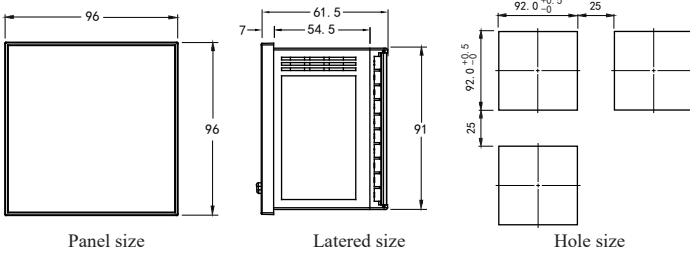
⚠ Warning:

1. If the coulometer is not operated according to the user manual, accident may happen and product may be damaged.
2. The information provided in this user manual will be modified without prior notice.
3. The right to explain the described information is reserved.

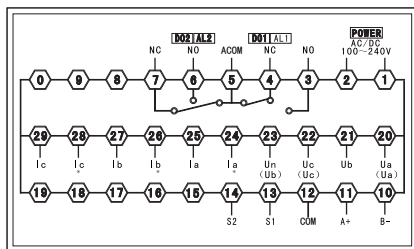
KKDS9E-802E-A/0-20190921

Resistance	Power supply and 485 port, DI port ≥ DC 2000V
Insulation	Input/output/power supply to meter cover > 5MΩ
Dimension	96H×96W×61.5L (mm)
Weight	0.5kg

IV. Dimension and installation (unit: mm)



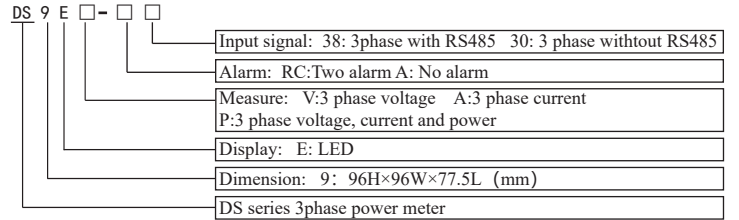
V. Connection



Pls subject to connection diagram showed on the meter.

Note: Voltage input connection terminal, labels in bracket show 3 phase 3 wire connection method. If there is any change, please subject to the connection on the meter.

I. Model Illustration



II. Ordering Information

Model	Measured signal	Communication	Alarm output
DS9E-V-RC38	3 phase voltage	1 loop RS485	2
DS9E-A-RC38	3 phase current	1 loop RS485	2
DS9E-P-RC38	3 phase voltage, current, power	1 loop RS485	2

III. Specification

Connection	3phase 3wire / 3phase 4wire
Voltage rating	AC 3×220V/380V (3x57.7V/100V)
Voltage overload	Continuous:1.2 times; Instantaneous: 2 times/2S
Voltage consumption	<0.5VA (per phase)
Voltage impedance	≥300KΩ
Voltage accuracy	RMS measurement, accuracy 0.5 class
Current rating	AC 0.025-5A
Current overload	Continuous:1.2 times; Instantaneous: 10 times/2S
Current consumption	<0.5VA (per phase)
Current impedance	<20mΩ
Current accuracy	RMS measurement, accuracy 0.5 class
Frequency	45 ~ 60Hz, accuracy 0.01Hz
Power	Active/reactive/apparent power, accuracy: 0.5 class
Display	Red LED
Power supply	AC/DC 100~240V (85 ~ 265V)
Power consumption	≤5VA
Output digit port	RS-485, MODBUS-RTU protocol
Alarm output	2 loop DO, AC 250V/3A or DC 30V/5A
Working Environment	Temperature: -10 ~ 50°C Humidity: < 85% RH; Non corrosive gas; altitude ≤ 2500m
Storage environment	-40~70°C

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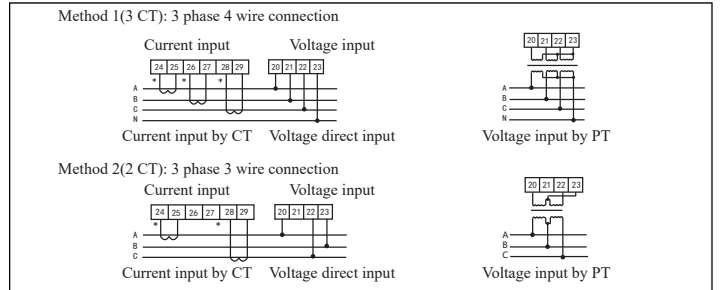


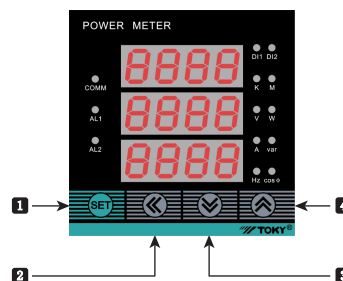
Illustration:

- 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 (power and energy).
- 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. For 3 pcs of CT, it should be 3 phase 4 wire connection. 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 signal 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 circuit board, in cause of leakage switch mis-action

VI. Panel Indication



Symbol	Illustration
DI1	DI 1 indicator
DI2	DI 2 indicator
K	Kilo unit
M	Million unit
V	Voltage display
W	Active power display
A	Current display
Var	Reactive power display
Hz	Frequency display
cosφ	Power factor display
COMM	Communication indicator
AL1	Alarm 1 indicator
AL2	Alarm 2 indicator

No.	Symbol	Name	Function
1	SET	Enter key	Press this key more than 3s to enter the menu; confirm the set value
2	◀	Left key	In menu operation, it can be used as return key; while modification, it can be used as shift key.
3	⏮	Decrease key	In menu operation, it is used to enter data setting; decrease value
4	⏭	Increase key	In menu operation, it is used to enter data setting; increase value

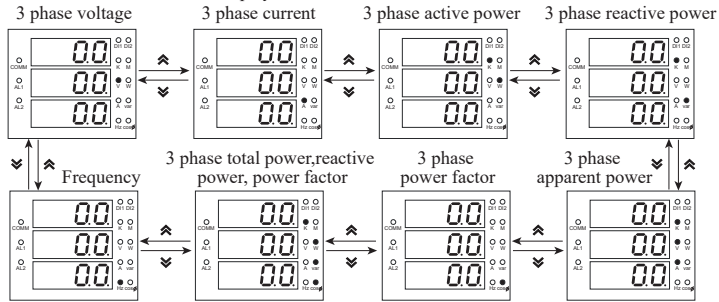
Measurement display interface illustration:

- Under 3 phase 4 wire measuring status, press "◀/⏮" key to shift display 3 phase voltage, 3 phase current, 3 phase active power, 3 phase reactive power, 3 phase apparent power, 3 phase power factor, frequency, etc.
- Under alarm mode, DO1, DO2 are used as alarm output status indicator. Under switching remote control mode, DO1 and DO2 are used as switching output status indicator.
- COM flash means communicating.

Note: The indication of 26 letters in LED

Letter	A	B	C	D	E	F	G	H	I	J	K	L	M
LED display	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓕ	Ⓖ	Ⓗ	Ⓘ	Ⓜ	Ⓝ	Ⓟ	Ⓡ
Letter	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
LED display	Ⓝ	Ⓞ	Ⓟ	Ⓠ	Ⓡ	Ⓢ	Ⓣ	Ⓤ	Ⓥ	Ⓦ	Ⓧ	Ⓨ	Ⓩ

Measurement interface shift display illustration:



(Note: Under 3 phase 3 wire measuring status, it only display 3 phase voltage, 3 phase current, total active power, reactive power, total power factor, frequency.)

VII. Menu Modification Illustration

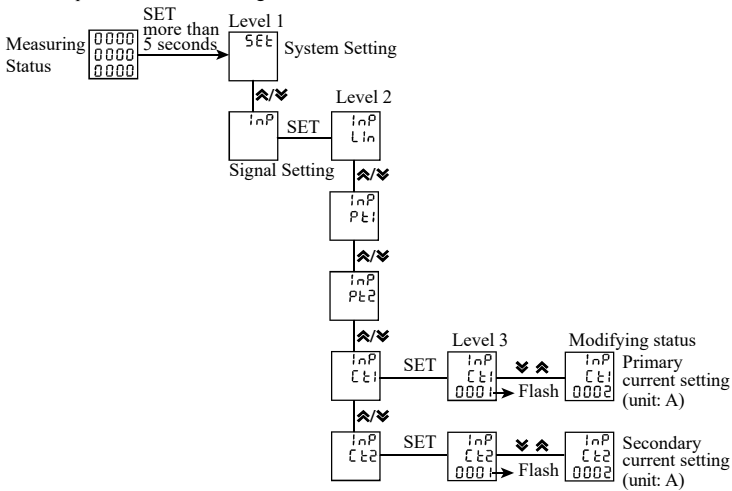
Under measuring status

- Under 3 phase 4 wire, press "⏮" or "⏭" key to respectively 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.
- Under 3 phase 4 wire, press "SET" key to make the voltage display value switch between phase voltage and line voltage. Under 3 phase 3 wire, it only display line voltage.
- Press "SET" key more than 5 second to enter user menu, operation procedure refers to menu structure.

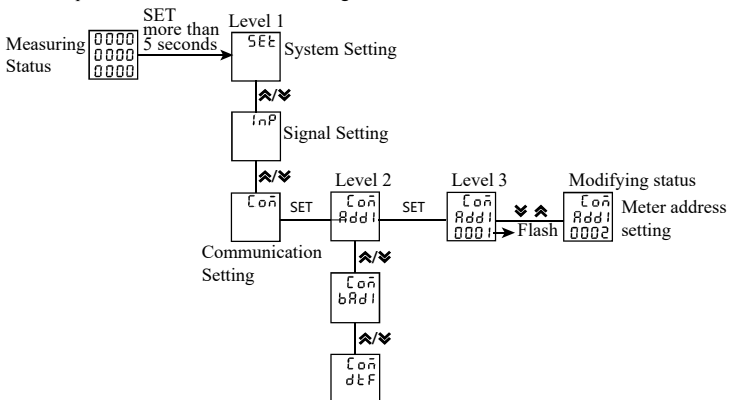
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Note: menu modification example

Example 1. current ratio setting method



Example 2. communication address setting method



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Under Customer Menu Status

- If the current display is Level 1 or Level 2, press SET key, enter into next level display, press "◀", "⏮" key to change menu or sub-menu.
- If the current display is Level 2 or Level 3, press "◀" key, return to previous display.
- If it is Level 3 display, press "⏮", "⏭" key flash the number, press "⏮", "⏭" key to modify, press "◀" key to shift, press "SET" key to save set value.
- After modification, press SET key more than 5 seconds to exit user menu and enter into measuring status, or press "◀" key to exit level by level.

Menu Structure and Function Description (Note: the decimal point of the parameter in the menu is fixed)

Level 1	Level 2	Level 3	Description	
System setting 5E E	CLEAR energy	CLRE	0000	Input "1111" to clear energy; Input "1234" to reset factory default
	Password	USEP	0000	Alter password, factory default "0000", no pass word
	Page time	PGEH	0000	Page turning time of measure display, unit: second. There is no page tuning if the value is 0.
	Software code	UEP	1.1	Software code
Signal setting i n P	Network	Lin	3-3 / 3-4	Select the input network of measure signal, 3 phase 3 wire or 3 phase 4 wire
	Voltage ratio	Pt1	0.1-999.9	Primary voltage, unit: KV
	Voltage ratio	Pt2	10.0-999.9	Secondary voltage, unit: V
	Current ratio	Ct1	1-999.9	Primary current, unit: A
Communication setting C o n	Address	Add	1-247	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	dEF	H-L / L-H	Data sequence: high register ahead or low register ahead
	Parity bit	PrtY	n/e/n/odd	No parity / even parity / odd parity
Alarm setting AL	Alarm mode	AdI	0-58	When value is DO, it is remote control mode, otherwise it is alarm mode, please refer to "alarm output electric parameters"
	Alarm value unit	UeI	1/2/n	1: 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 (The unit is standard display unit)
	Alarm hysteresis	HY1	0-999.9	1st alarm hysteresis value setting (the unit is standard display unit)
	Selection of alarm relay	oUeI	rL1/rL2	1st alarm relay output for selection
	delay time	dLR	0-99.9	delay time, unit: second
Alarm ending time	dLb	0-99.9	Reset time, unit: second	
For 2nd alarm parameters setting, please refer 1st alarm setting mode.				

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VIII. Output function

1. DO1 & DO2 can be used to remote control electrical equipment. To use this function, the alarm mode should be set as "0"(DO), otherwise DO1, DO2 are used as alarm AL1, AL2 output; DO1, DO2 function control value can be wrote by RS485 port.

2. Alarm function, after power on and steady run for more than 5 sec, alarm start to work. (refer to table below)

Alarm output electric parameters

No.	Item	DO (low alarm) code	DO (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 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 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 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 (PFL)	50 (PFH)
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)

IX. Communication protocol

1. Communication function(communication protocol can be downloaded from our website: www.toky.com.cn or acquired from our Technical Service Dept.)

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