SFERE

Guide Rail Type Electric Energy Meter
Operation Manual

This manual is applied to the following models：

DDS1946/DDS1946-T/DDSF1946/DSS1946/DSSF1946

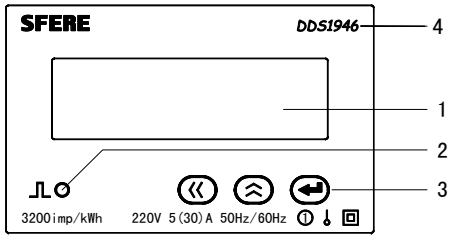
DSSD1946/DTS1946/DTS1946-T/DTSF1946/DTSD1946

1. Product introduction

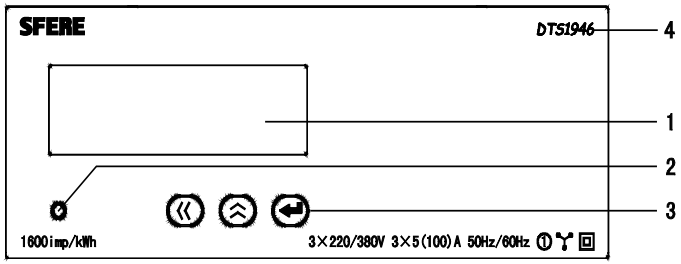
Guide rail type electric energy meters are designed and produced according to user's real electricity consumption situation by adopting advanced energy measurement IC and using digital sampling processing and SMT technologies. They are used to measure the real-time parameters of voltage, current, power, power factor, frequency and demand. They also have the functions such as energy measurement, SOE, pulse and communication. This series of energy meters adopt modularity structure with the features such as small volume, convenient installation and reliable working.

2. Panel description

Single phase guide rail type electric energy meter panel



Three phase guide rail type electric energy meter panel

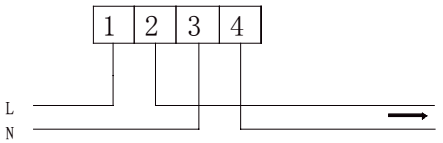


1：Display interface　2：Energy pulse indication light　3：Buttons　4:Model

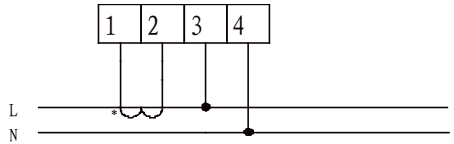
3. Installation and Wiring

3.1 Wiring mode

Single Phase

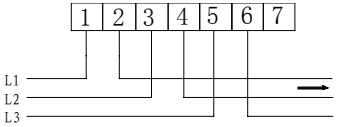


single phase direct connection

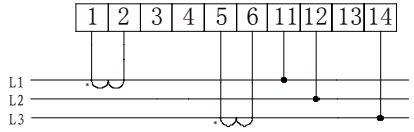


single phase connection via CT

Three phase three wire

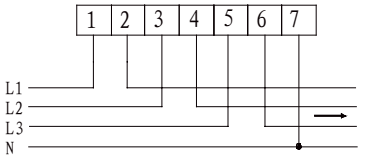


three phase three wire
direct connection

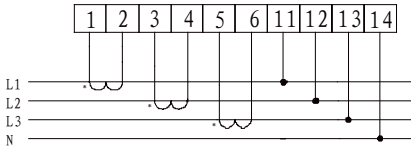


three phase three wire
connection via CT

Three phase four wire

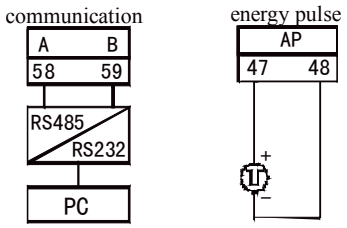


three phase four wire
direct connection



three phase four wire
connection via CT

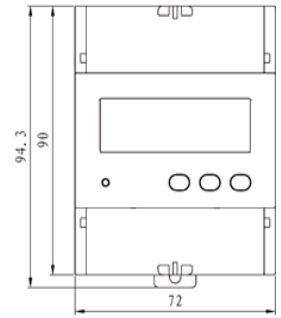
Signal terminal wiring diagram



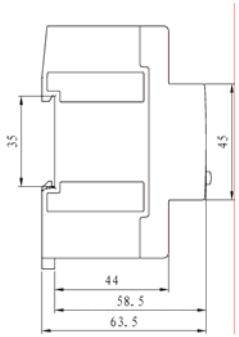
3.2 Outline dimension

Single phase meter outline dimension (mm)

front view

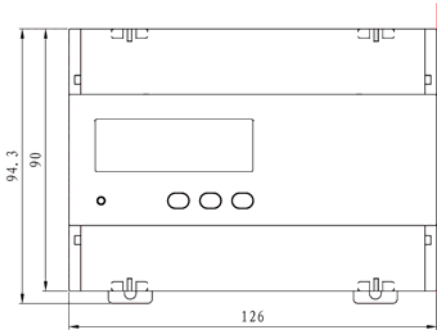


side view

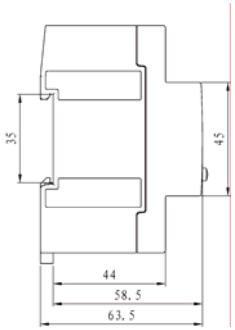


Three phase meter outline dimension (mm)

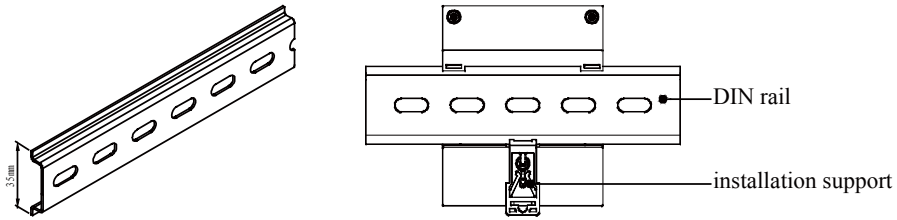
front view



side view



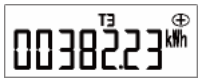
3.3 Installation method



4. Display

Guide rail type electric energy meter shows the measured data of voltage, current, power, power factor, frequency and electric energy. Press ⟨⟨ and ⩔ buttons at the same time to switch between electric energy interface and electric quantity interface.

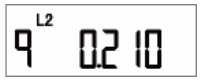
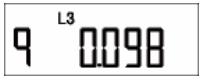
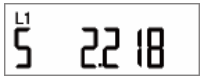
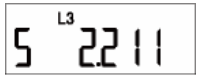
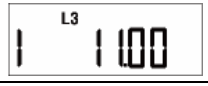
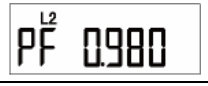
Electric energy display interfaces

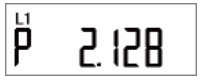
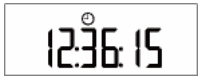
Display interface	Description	Display interface	Description
	Import active electric energy: EP =780.62 kWh		Total tariff energy (tip): 208.09 kWh
	Export active electric energy: EP- = 0.00 kWh		Total tariff energy (peak): 101.06 kWh
	Import reactive electric energy: EQ = 18.80 kvarh		Total tariff energy (level): 382.23 kWh
	Export reactive electric energy: EQ- = 7.10 kvarh		Total tariff energy (valley): 89.24 kWh

Electric quantity display interface of single phase meter：

Display interface	Description	Display interface	Description
	Voltage： U = 220.0 V		Apparent power： S = 7.700 kVA
	Current： I = 35.00 A		Power factor： PF = 1.000
	Active power： P = 7.700 kW		Frequency： F = 50.00Hz
	Reactive power： Q = -0.006 kW		

Electric quantity interface of three phase meter (e.g. three phase four wiring mode)

Display interface	Description	Display interface	Description
	Phase voltage Ua Ua = 220.1 V		Phase B reactive power Qb = 0.210 kvar
	Phase voltageUb Ub = 220.2 V		Phase C reactive power Qc = 0.098 kvar
	Phase voltageUc Uc = 220.0 V		Total reactive power Q = 0.416 kvar
	Line voltage Uab Uab = 381.3V		Phase A apparent power Sa = 2.218 kVA
	Line voltage Ubc Ubc = 381.2 V		Phase B apparent power Sb = 2.207 kVA
	Line voltage Uca Uca = 381.2 V		Phase C apparent power Sc = 2.211 kVA
	Phase A current Ia = 10.10A		Total apparent power S = 6.636 kVA
	Phase B current Ib = 10.20A		Phase A power factor PFa = 0.998
	Phase C current Ic = 11.00A		Phase B power factor PFb = 0.980

	Phase A active power Pa = 2.128 kW		Phase C power factor PFc = 0.960
	Phase B active power Pb = 2.040 kW		Total power factor PF = .979
	Phase C active power Pc = 2.100 kW		Grid frequency F = 50.00 Hz
	Total active power P = 6.267 kW		Time: year-month-day 2012, August 6th
	Phase A reactive power Qa = 0.108 kvar		Time: hour-minute-second 12: 36: 15

5. Setting

Enter programming mode

Keep pressing ⟨⟨ and ⩓ buttons for more than 3 seconds in electric energy display interface until CodE appears. Then press ⟨⟨ or ⩓ button to input password (defaulted as 0000). After inputting correct password, press ↵ button to enter setting interface.

Exit programming mode

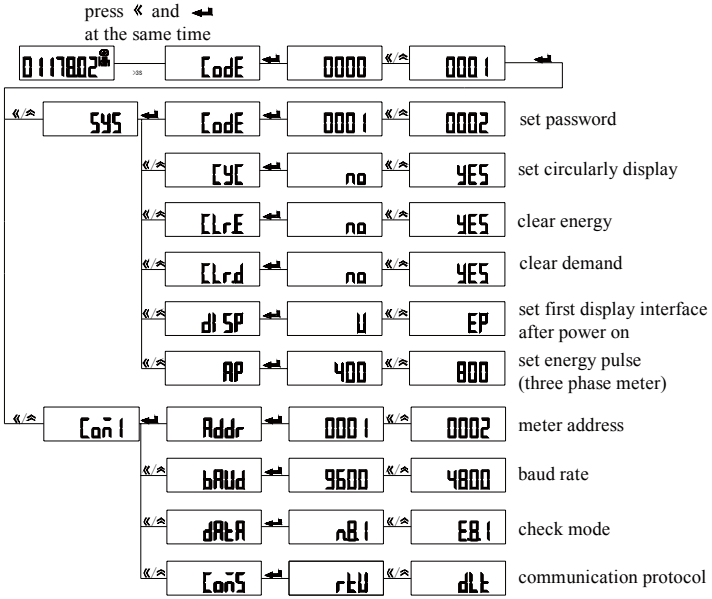
After changing the data of items of third level menu, press ↵ button to confirm the modification. If user wants to cancel the modification, please press ⟨⟨ and ⩓ buttons at the same time. After confirm or cancel the modification, press ⟨⟨ and ⩓ buttons to return to first level menu. Now press ⟨⟨ and ⩓ buttons again, no appears. There are two choices at this situation:

1）Press ↵ button not to save setting parameters;

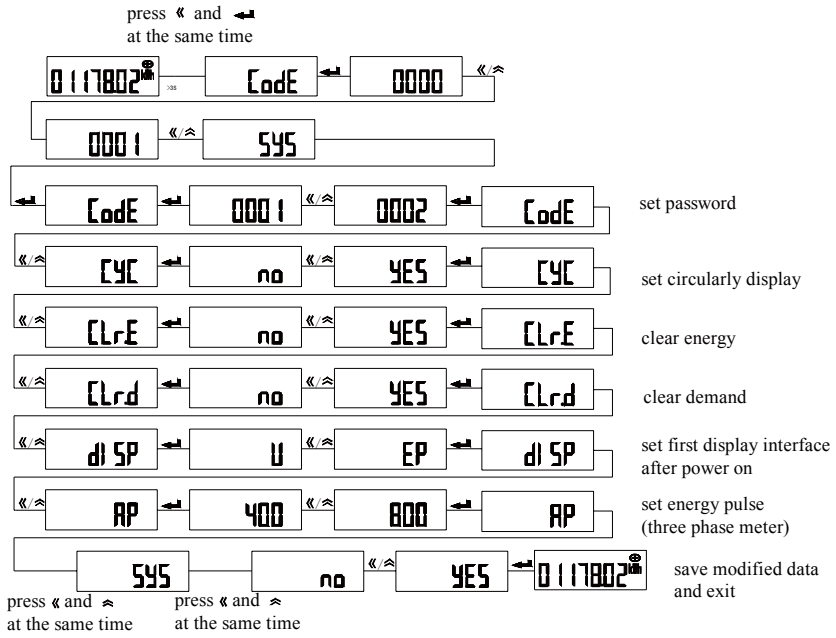
2）Press ↵ ⟨⟨ and ⩓ buttons to select YES, then press ↵ button to save setting parameters.

In parameter setting operation, ⟨⟨ button is used to switch between menus and select numbers at different bits, ⩓ button is used to switch between menus and change the number at same bit, ⟨⟨ and ⩓ buttons are used as combined buttons for returning to upper level menu or canceling modification, ↵ button is used to enter next level menu or confirm modification.

Setting menu

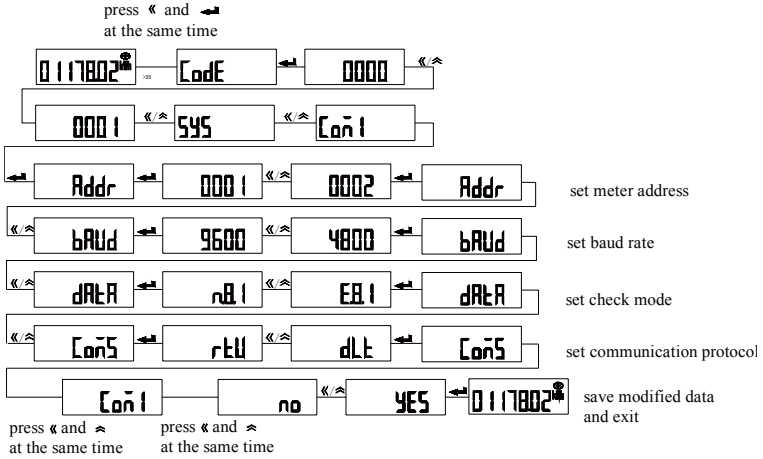


System parameter setting menu



Communication setting

Set communication address as 2, select baud rate 4800bps, set check mode E.8.1, and choose DLT645 communication protocol.



6. Technical parameters

Electrical feature				
Model / Function		DDS1946 DDS1946-T DDSF1946	DSS1946 DSSF1946 DSSD1946	DTS1946 DTS1946-T DTSF1946 DTSD1946
Accuracy		voltage, current：Class 1 power active energy：Class 1		
Rated voltage		220V	3×380V	3×220/380V
Input current	Direct input	5(30)A，10(60)A	5(100)A	
	Input via CT	1.5(6)A		
Frequency		50/60 Hz		
Wiring mode		Single phase	three phase three wire	three phase four wire
Voltage range		0.8Un ～ 1.2Un		
Consumption	voltage circuit consumption	< 5VA		
	current circuit	< 2VA		

	consumption		
Start current	direct input	0.004Ib	
	input via CT	0.002In	
Energy pulse		one active energy optoelectronic isolation output, pulse width （80±20%）ms	
Time error		≤0.5s	
Communication feature			
RS485 communication interface		Modbus-RTU protocol(optional)，baud rate up to 9600bps DL/T 645 communication protocol (optional)，baud rate up to 9600bps	
Mechanical feature			
Dimension		72×90×63.5	126×90×63.5
IP protection		IP54（panel）/IP20（case）	
Environment feature			
Work temperature		(-10～55)℃	
Storage temperature		(-25～70)℃	
Relative humidity		(5～95)%（no condensation）	
EMC			
Electrostatic discharge immunity		IEC 61000-4-2-III class	
Radiated, radio-frequency, electromagnetic field immunity		IEC 61000-4-3-III class	
Electrical fast transient/burst immunity test		IEC 61000-4-4-Ⅳ class	
Surge immunity		IEC 61000-4-5-Ⅳ class	
Immunity to conducted disturbances, induced by radio-frequency fields		IEC 61000-4-6-III class	
Power frequency magnetic field immunity		IEC 61000-4-8-III class	
Voltage dips, short interruptions and voltage variations immunity		IEC 61000-4-11-III class	

The information in this document is subject to changes without any further notice.

JIANGSU SFERE ELECTRIC CO., LTD.
Add.: 99 Chengjiang R.(E), Jiangyin, Jiangsu, China.
P.C.: 214429
Tel.: 0086-510-86199063
Fax: 0086-510-86199069
http://www.meter-sfere.com
Email: justinsfere@gmail.com
cdwjc@hotmail.com