

# User Manual

Multi-function power Meter

Teco-E20-P

## Safety instructions

### **Dangerous voltage!**

Danger to life or risk of serious injury. Disconnect system and device from power supply before beginning work.



### **Caution:**

Please follow the documentation. This symbol warns of possible danger that can arise during



### **CAUTION:**

- Make sure only the qualified technicians perform the installation and maintenance;
- Before performing wiring operation to the meter, make sure the CT input signal and the power supply are switched off;
- The electrical parameters supplied should be within the rated range; The following situations may result in damages to the meter or cause mistakes in the operation of the meter.
- The voltage of the auxiliary power supply goes beyond the rated range.
- The frequency of the power distribution system goes beyond the rated range.
- The input polarity of the voltage or the current is incorrect.
- Remove or connect the communication plugs without powering off.
- Wrongly connected the signal terminal wires to power supply source.

**Please don't touch the rear terminals when the meter is in operation!**



## 1. Product description

Teco-E20-P multi-function power meters can measure voltage, current, frequency, power, power factor, energy, harmonics and demand, record SOE events, and realize off-limit alarm. They also have the functions such as communication, digital input, relay output and energy pulse output. As an advanced smart digital front-end acquisition components for grid, they are widely applied in many kinds of control systems, energy management systems, substation automation systems, power distribution automation systems, smart distributors and switch cabinets. This series of products provide many wiring methods and convenient operation methods which can meet different requirements at field.

- Wrongly connected the signal terminal wires to power supply source.

## 2. Model selection

		Teco-E20-P
<b>Appearance and accuracy</b>	Display mode	LCD
	Installation mode	Panel mounting
	Active energy accuracy	0.5S
	Reactive energy accuracy	2S
<b>Real-time measurement</b>	U/I/P/Q/S/PF/F	■
	Demand	■
	Neutral current	-
<b>Energy metering</b>	Bi-directional energy	■
	Four-quadrant reactive energy	■
	Spare energy	-
	Tariff energy	-
<b>Power quality</b>	Voltage/current THD	-
	Sub-harmonic content	-
	Sequence component and phase position of voltage and current	-
	Voltage and current unbalance	-
	Crest factor, current K factor	-
<b>Data record</b>	Meter/load running time	■
	Demand/max./min. Value record	-
	Off-limit record	-
	SOE event record	-
<b>Input and output</b>	Energy pulse output	■
	RS485 communication interface	■
	Digital input	-
	Relay output	-

### 3. Technical parameters

#### 3.1 Technical specification

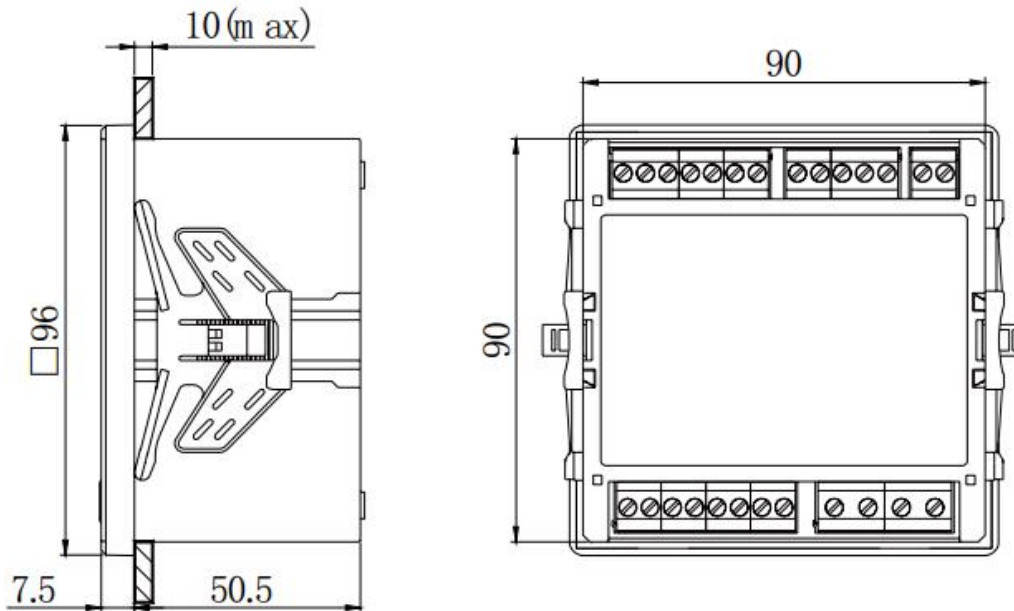
<b>Working environment</b>	
Working temperature	-10°C to 55°C
Storage temperature	-25°C to 70°C
Relative humidity	≤95% RH, no condensation
Working altitude	≤2500m
Protection degree	Front case IP64, rear case IP20.
Insulation	Between signal, power supply, output terminal to case resistance >100MΩ
<b>Working power supply</b>	
Rated range	AC/DC (20~300) V
Power consumption	≤5VA
Withstand voltage	≥2kV
<b>Voltage input</b>	
Rated range	230V/400V (continuous: 1.2Un)
Resolution	0.1 V
Impedance	1.6 MΩ/per phase
Power consumption	≤0.1 VA /per phase
Over voltage	Instantaneous: 2 times/10s
Frequency	45-65 Hz
<b>Current input</b>	
Range	5A/1A, (continuous: 1.2In)
Resolution	1 mA
Impedance	≤20mΩ/per phase
Power consumption	≤0.2 VA/per phase
Over current	Instantaneous: 10 times/5s
<b>Relay output</b>	
Capacity	5A/250 VAC; 5A/30 VDC

Isolation voltage	Between contact and coil: 2000 VAC / min
Action time	10 ms max
Release time	5 ms max
Mechanical service life	10 <sup>6</sup> times
<b>Energy pulse output</b>	
Pulse width	80ms±20%
Max. terminal voltage	35V
Max. terminal current	10mA
Pulse frequency	≤10Hz
<b>Digital input</b>	
Sensitivity	ON:140~270V AC, OFF: <110 V AC
Isolation voltage	5000 VAC (1 min)
Scanning time	1 ms
Wave filtering time	30 ms
<b>Communication interface</b>	
Physical interface	RS-485
Communication speed	Up to 115.2 kbps
Communication protocol	Modbus-RTU
Isolation voltage	2000 VAC (1 min)
<b>Real-time clock</b>	
Error	≤0.5s/day
<b>Electromagnetic compatibility</b>	
Electrostatic discharge immunity: IEC 61000-4-2-III Radiated, radio-frequency, electromagnetic field immunity: IEC 61000-4-3-III Electrical fast transient/burst immunity: IEC 61000-4-4-IV Surge immunity: IEC 61000-4-5-IV Immunity to conducted disturbances, induced by radio-frequency fields: IEC 61000-4-6-III Power frequency magnetic field immunity: IEC 61000-4-8-III Voltage dips, short interruptions and voltage variations immunity: IEC 61000-4-11-III	

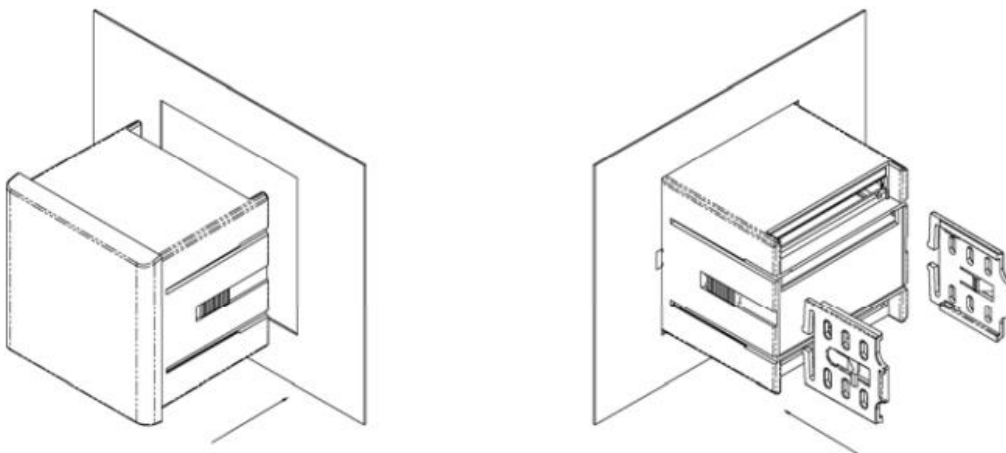
### 3.2 Function parameters

Functions	Sign	Accuracy	Range	Display range
Voltage	U	0.5	10--380 V	0--999.9 kV
Current	I	0.5	0--5 A	0--99.99 kA
Active power	P	0.5	0--5.7 kW	0--9999 MW
Reactive power	Q	0.5	0--5.7 kvar	0--9999 Mvar
Apparent power	S	0.5	0--5.7 kVA	0--9999 MVA
Power factor	PF	0.5	0--1.00	0--1.000
Frequency	F	±0.01Hz	45--65 Hz	45.00Hz-65.00 Hz
Active energy	EP	0.5s	--	0--99999999 MWh
Reactive energy	EQ	2	--	0--99999999 Mvarh
Voltage THD	THDu	Class A	51	0--99.99 %
Current THD	THDi	Class A	51	0--99.99 %
Voltage sub-harmonic content	HRU <sub>h</sub>	Class A	51	0--99.99 %
Current sub-harmonic content	HRI <sub>h</sub>	Class A	51	0--99.99 %
Voltage unbalance	Uunb	Class B	--	--
Current unbalance	Iunb	Class B	--	--
Voltage sequence component	U1, U2, U0	0.5	--	--
Voltage phase position	$\theta_{U L1}, \theta_{U L2},$ $\theta_{U L3}$	±0.1°		
Current sequence component	I1, I2, I0	0.5	--	--
Current phase position	$\theta_{I L1}, \theta_{I L2}, \theta_{I}$ L3	±0.1°		
Extreme value	Max/Min	0.5	--	--
Demand	--	0.5	--	--

#### 4. Meter dimensions



#### 5. Installation method



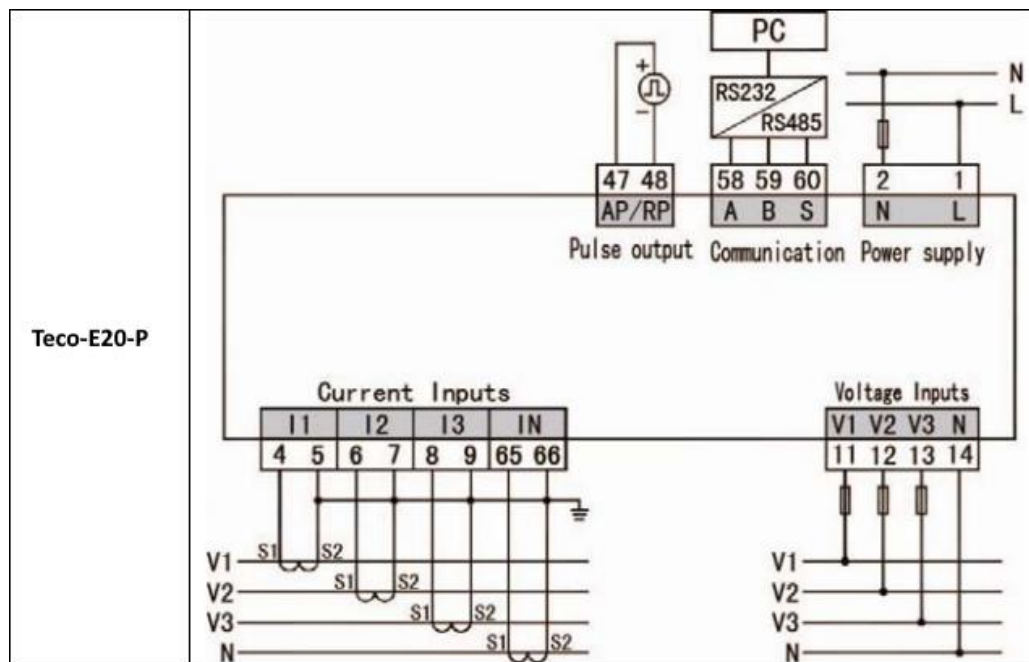
- 1) Open a 91×91 ( mm ) hole on fixed switch gear;
- 2) Take the fixing claps off the meter;
- 3) Insert the meter to the cut-out;
- 4) Place the fixing claps, insert, fasten and fix the meter firmly on the panel.

## 6. Functions of wiring terminals

Function wiring terminals adopt the following numbers:

Power supply	1, 2	For AC and DC
Current signals	4, 5, 6, 7, 8, 9, 65, 66	Current input
Voltage signals	11, 12, 13, 14	Voltage input
Relay output	15—17	Two relay outputs
Energy pulse output	47, 48	Energy pulse output
RS485 communication	58, 59, 60	A, B and S severally.
Digital input	70—71, 72—73	Two digital inputs

## 7. Typical wiring diagram





## 8. Display

### Panel description

