UNI-T®

UT265B

Operating Manual

Intelligent Double Clamp Phase Digital Voltammeter

P/N:110401103630X
DATE:2018.06.26
REV.2

Contents

⚠ Warnings

Thank you for purchasing our product UT265 intelligent double clamp phase digital voltammeter (also known as automatic dual-clamp digital phase voltampere meter). In order to use the meter properly, please follow instructions below:

———Read user manual carefully

———Strictly observe safety rules and notes mentioned in this manual

- Please use the meter carefully under any circumstance.
- Pay attention to word labels and symbols on front and back panels
- Please check there is no missing, damaged or exposed parts before use.
- Do not measure voltage higher than 600V.
- Do not use the meter if back and battery covers are not well placed.
- Please ensure test leads are firmly connected.
- Do not use the meter or change the battery if it is moisture-affected.

- It is prohibited to test on inflammable and dangerous sites
- Disconnect test leads with the conductor before unplugging out of the meter; to avoid electric shock do not touch input terminals
- Keep the meter away from strong electromagnetic environment to ensure normal operation.
- The operation will be invalid if simultaneously pressing two buttons or more.
- Stop using the meter if the housing or test lead is found with any fracture and metal exposure.
- Do not place and store the meter on sites with high temperature, humidity, moisture condensation or strong sunlight.
- The meter and current jaw should be regularly maintained and kept clean; any corrosive or rough cloth is not allowed to clean the jaw.
- To avoid causing electric shock to current clamp, especially its adjoining surface

- The meter is designed with auto power off function.
- Remove away the battery if not used for a long time and ensure right polarity when changing battery.
- Please know well specified measuring scope and working environment of the meter
- Only authorized personnel can use, discharge, calibrate and repair the meter.
- Stop using the meter and pack immediately for the authorized treatment if further operation will cause potential risks
- 2 COM terminals on the meter belong to the same circuit line since short circuit internally.
- “ ⚠ ” warning symbol, is used in the manual to indicate the operator should conform to safety notes.
- “ ⚡ ” danger mark, is used in the manual to indicate the operator must strictly follow the safe rules.

I. Introduction

UT265 intelligent double clamp phase digital voltammeter (also known as Automatic dual-clamp digital phase voltampere meter) comes out from tremendous efforts of our company and is a totally automatic, multi-functional, digital and intelligent tool especially designed for on-site measurement. It is an update version of machinery knob-type voltampere meter, easier to operate and less likely to make errors and therefore stands out with following advantages: high accuracy, high stability, low power consumption and convenient handling. With the loop kept connected, the meter can measure two-way AC voltage, current, phase angles between voltages, currents or both, frequency, phase sequence, active, reactive and apparent powers, power factor; differentiate wiring groups of transformers, inductive and capacitive circuits; test secondary loop and bus differential protection system; read out differential protection phase between CT units; check and ensure

correct wiring of kilowatt-hour meter and good conditions of wiring equipment, which all together turn the meter into a safe, accurate, convenient new model of instrument for electrical inspection.
The meter, designed with molded housing made in latest materials and anti-vibration, anti-skidding, high-insulation protection jacket, can offer 240dots×160dots and dynamic display together with vector diagram indication, thus presenting users luxurious and elegant exterior structure. It is equipped with RS232 and available for data storage of 1500 sets which can be transferred into PC through system software for further online real-time monitoring, history lookup, dynamic display, data readout, save, report and printing, ect.

It is also called automatic dual-clamp digital phase voltampere meter, multi-purpose dual-clamp digital phase voltampere meter, automatic phase voltampere meter, or digital phase voltampere meter. The meter integrates functions from general machinery dual-clamp digital phase voltampere meter and can be applied in electric power, petrochemical, metallurgy, railway,

factories and mining, R&D institutes, metrological department. It is particularly needed in electric charging and relay protection system, electric power calculation, check and monitoring from power supply remarketing departments as well as electric installment, relay protection, differential inspection, start-up testing, power transformation check , electrical training, skill competition performed by technical department.

II. Electrical Symbols

⚡	Extreme danger! To avoid personal injury or accidents in case of electric shock, observe safety rules strictly
⚠	Danger! To avoid electric shock, personal injury or accidents, please follow safety notes.
⚠	Warning! Confirm to safety instructions, otherwise it may cause personal injury or meter damage

~	Alternating Current(AC)
⎓	Direct Current(DC)
⧈	Dual Insulation

III. Technical Specifications

1. Reference and Operating Conditions

Factors	Reference Conditions	Operating Conditions	Notes
Ambient Temperature	23℃±1℃	-10℃～40℃	-----
Ambient Humidity	40%～60%	＜80%	-----
Waveform	Sine wave	Sine wave	β =0.01
Frequency	50HZ±1HZ	45HZ～65HZ	-----
Working Voltage	9V±0.1V	9V±1.5V	-----

Current Amplitude when measuring frequency phase sequence	200mA±3mA	10mA～20A	----
Voltage Amplitude when measuring frequency phase sequence	100V±5V	10V～600V	----
Current Amplitude when measuring power factor	200mA±3mA	20mA～20A	----
Voltage Amplitude when measuring power factor	100V±5V	10V～600V	----
External Electromagnetic Field	Avoided		
Conductor Location	Placed on geometric center of the jaw		

2. General Specifications

Functions	To measure two-way AC voltage, current, phase angle between voltages, current or both, frequency, phase sequence, active, reactive and apparent powers, power factor; differentiate wiring groups of transformers, inductive and capacitive circuits; test secondary loop and bus differential protection system; read out differential protection phase between CT units; check and ensure correct wiring of kilowatt-hour meter and good condition of wiring equipments, ect
Power	DC9V Alkaline dry battery(1.5V AA×6)
Range (Fully Automatic)	Voltage: AC 0.00V～600V
	Current: AC 0.0mA～20.0A

	Phase Angle: 0.0° ～360.0°
	Frequency: 45.00Hz～65.00Hz
	Active Power: 0.0W～12kW
	Reactive Power: 0.0VAR～12kVAR
	Apparent Power: 0.0VA～12kVA
	Power Factor: -1～+1
Jaw Size	Sharp current clamp: 7.5mm×13mm
Resolution	Voltage: AC 0.01V
	Current: AC 0.1mA
	Phase Angle：0.1°
	Frequency: 0.01Hz
	Active Power: 0.1W
	Reactive Power: 0.1VAR
	Apparent Power: 0.1VA

	Power Factor: 0.001
Data Storage	1500 sets
RS232 Interface	With RS232,all data transferred into PC for further data management and analysis
Communication line	Rs232 type, 1.8 meters long
Power Consumption	Max.70mA consumed with backlight on, 12 hours for battery life
	50mA with backlight off, 16 hours for battery life
Display Mode	LCD display, 240dots×160dots
Dimensions	Long × Wide× Thick: 196mm×92mm×54mm
Measuring Speed Rate	About 2 seconds per time
Data Hold	Press HOLD button to maintain data , indicated by HD symbol
Backlight	Available, used on dark sites and at night

Auto Power Off	Auto power off to reduce power loss 15mins later after power on
Battery Voltage	Low battery displays with voltage lower than 7.2V, please change batteries
Weight	The meter：550g(battery included)
	Current Clamp：170g×2
	Test leads：250g
Testing Lead Length	1.5m
Clamp Wire Length	2m× φ5mm
Working Temperature /Humidity	-10℃～40℃；＜80%Rh
Storage Temperature/Humidity	-10℃～60℃；＜70%Rh
Input Impedance	Input impedance for measuring voltage： 2MΩ

Withstand Voltage	meter circuits and housing, able to withstand AC voltage1000V/50Hz for 1 minutes when input sine wave
Insulation	For circuits and protected housing ≥100MΩ
Structure	Double Insulation, coupled with vibration-proof insulation jacket
Safety Standards Followed	IEC61010-1 CAT Ⅲ 600V，IEC61010-031，IEC61326，Pollution Class2

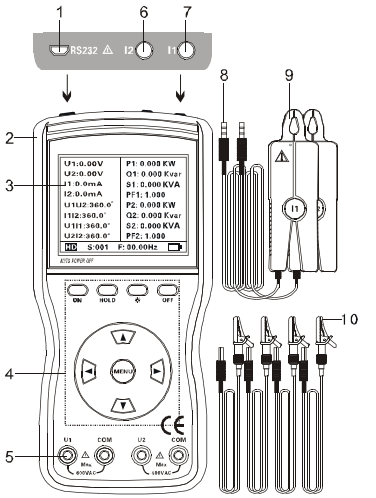
3. General Differences and Performance Indexes under Reference Conditions

Items	Range	Resolution	General Difference
Voltage	AC 0.00V～600V	0.01V	±(1.5%rdg+3dgt)
Current	AC 0.0mA～20.0A	0.1mA	±(1.5%rdg+3dgt)
Phase Angle	0.0° ～360°	0.1°	±1°
Active Power P	0.0W～12kW	0.1W	±(3%rdg+3dgt)
Reactive Power Q	0.0VAR～12kVAR	0.1VAR	±(3%rdg+3dgt)
Apparent Power S	0.0VA～12kVA	0.1VA	±(3%rdg+3dgt)
Power Factor PF	-1～+1	0.001	±0.03
Frequency F	45HZ～65HZ	0.01HZ	±(2%rdg+3dgt)

Notes1: Phase angle differences should not exceed ±3° under the working conditions.

IV. Structure of Meter

1. RS232 Interface
2. Vibration-Proof Insulation Jacket
3. LCD Display
4. Function Keypad
5. Two-way Voltage Input Terminals
6. Current Input Terminal I2
7. Current Input Terminal I1
8. Current Clamp Output Plug
9. Sharp Current Jaw
10. Voltage Input Testing Leads



V. Operating Instructions

⚠ **Notes:**

- Please carefully check to ensure there are no damaged parts before operating the meter.
- Do not use the meter on dangerous sites.
- Install the battery as specified in the manual.
- Do not simultaneously press 2 buttons or more in case of invalid operation.

1. Power On/Off

Press ON to power on and LCD displays. Press OFF button, the meter will automatically switch off 15 minutes later after power on.

2. Backlight Control

Press ☼ button after power on to control the backlight, which is suitable on dark sites and at night.

3. Data Hold, Cancel and Save

Under measuring status, press HOLD button to keep displayed data, indicated by "HD" icon, and repress to cancel the operation. The meter will automatically save and number current data when holding data, indicated by group serial number such as S：001. Maximum storage is 1500 sets and achieved when "FULL" icon displays.

4. Data Access and Exit

Press MENU to access existing data during measurement, indicated by "RD" icon, then data lookup starts from "R：001", press Up to increment by 1, Down to increment by 10 and Left to exit and return to measuring mode.

5. Data Delete

Press Right button to choose delete option when still under data access status, then Left or Right to move the cursor to select "YES" or "NO", next MENU button for confirmation or exit, finally returning to measuring

mode.

6. Data Transmission to PC

The accessory USB-RS232 connection line is used for communication of the meter with PC. With the meter powered on and the software running, several following operations such as history lookup, data recall, save, report sheet, history printing can all be performed. The more data the meter saves, more time it will take to read out. History data can be saved in Txt or Excel format.

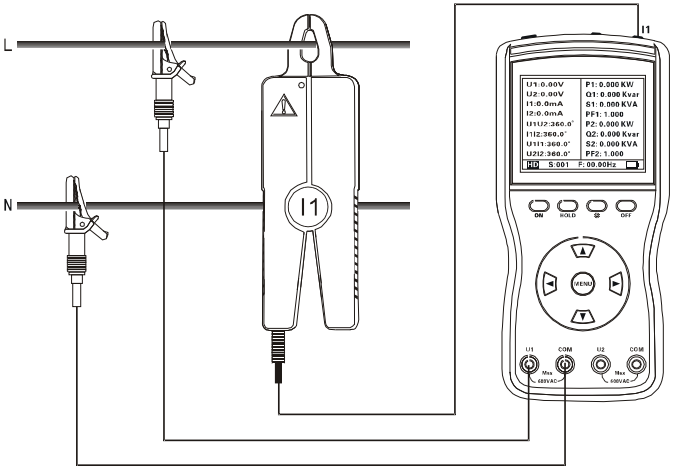
7. Measurement

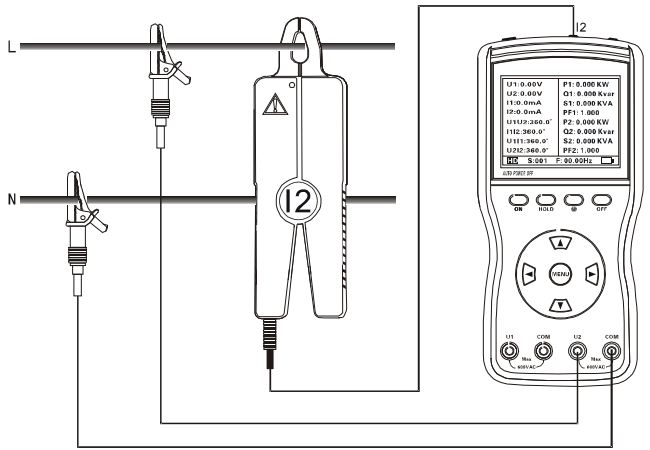
⚡	Electric Shock, Danger! To avoid any damage to the meter or personal injury in case of electric shock, only trained and authorized staff is allowed to operate and should strictly observe safety rules
	Danger! To avoid any damage to the meter or personal injury in case of electric shock do not measure circuit voltage above 600V

	Danger! Do not measure current above 20A, otherwise it may damage the meter!
⚠	Connect wires as specified in the manual and avoid wrong inserts between I1 and I2 .
	Disconnect test leads with conductors before unplugging out of the meter after measuring.
⚠	Measuring phase relations for the meter: U1U2, I1I2, U1I1,U2I2, the former signal always precedes the latter
	P1, Q1, S1, PF1 are parameters of U1-I1 and P2, Q2, S2, PF2 for U2-I2 parameters
	Voltage terminals U1, U2 are named the same with red marks on current clamps.
	Current clamping direction should accord with those red marks on the clamp during phase measuring.

The meter can measure two-way AC voltage, current, phase angle between voltages, currents or both, frequency, phase sequence, active, reactive and apparent powers, power factor, inductive and capacitive circuits. Wire connection shows as below:

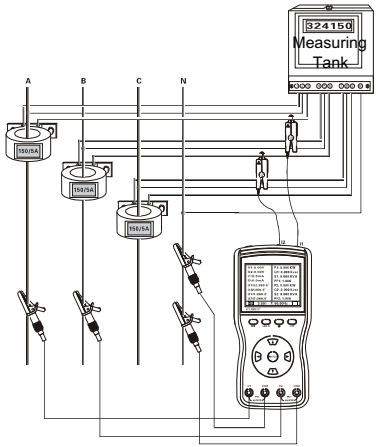
Single-Phase Measurement: Connect measured voltage lines L and N to terminals red U1 and black COM, then get current clamp I1 enclose L line. It is able to measure single-phase voltage, current, phase, frequency, power factor, ect. See Figure below. You can also use red U2, COM and I2 for measurement.



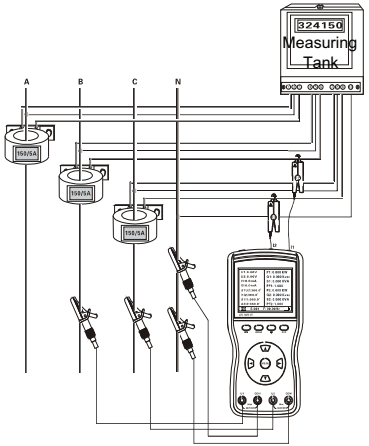


Three-Phase Four-Wire Measurement: It takes two steps to measure three-phase four-wire voltage, current, phase angle, phase sequence, frequency, power factor, ect. Refer to the table and figure for right connection.(it is internally short-circuit for 2 COM terminals and so any COM can be selected for connection with N line.)

Step 1		Step 2	
Three-Phase Four-wire circuits	The Meter	Three-Phase Four-Wire circuits	The Meter
Yellow UA	Red U1	Green UB	Red U1
Green UB	Red U2	Red UC	Red U2
Black N	Black COM	Black N	Black COM

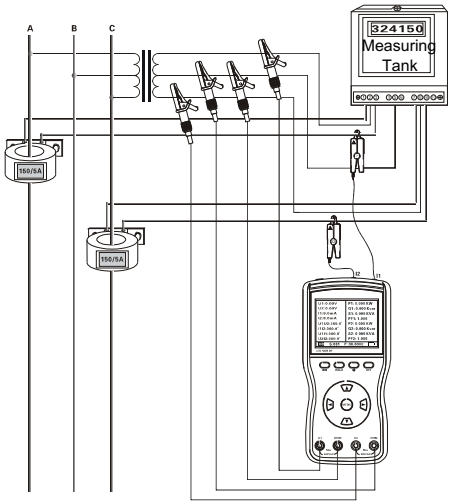


（Step 1）



（Step 2）

Three-Phase Three-Wire Measurement: Connect measured voltage lines yellow UA, green UB and red UC to terminals red U1, black COM and U2, then get current clamps I1 and I2 enclose measured lines IA and IC. It is able to measure three-phase three-wire voltage, current, phase angle and sequence, frequency, power and power factor, ect. Refer to Figure below for right connection.(It is internally short-circuit for 2 COM terminals on the meter, so any COM terminal can be selected for connection with N neutral line.)



It is possible to differentiate among inductive and capacitive load, phase sequence and the polarity during measuring. If U1I1 phase angle is displayed ranging from 0° ～90°, it measured load will be diagnosed as inductive; it is capacitive load with scope from 270° ～360°; it is positive phase sequence and has the same polarity with phase angles all close to120° ; otherwise positive phase sequence and reverse polarity are obtained with phase angle close to120° and 300° (it may caused by wrong current clamping or wiring connection), other conditions will be identified as reverse phase sequence (absence of phase not considered).

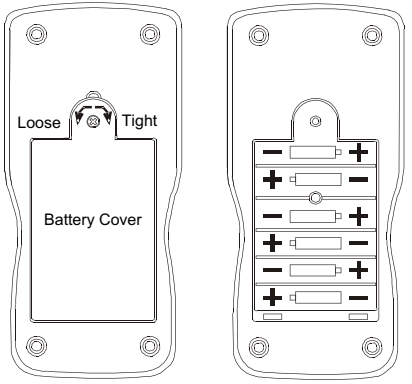
VI. Battery Replacement

⚠ **Notes:**

- To avoid damage to the meter, ensure correct polarity when installing batteries.
- It is prohibited to replace batteries on dangerous sites
- Please use specified alkaline dry battery(1.5V AA×6)
- Old and new batteries are not allowed to match together for use

1. Low battery icon displays with power supply below 7.2V, please change batteries timely and do as below:
2. Press OFF button to power off.
3. Use cross-shaped screwdriver to loosen one bolt away from the battery cover and open it.
4. Replace old batteries with new ones and ensure right polarity is selected.
5. Close the battery cover and tighten the bolt.

6. Press ON button to check if the battery is successfully replaced, if not, repeat operations from the second step.
7. Take the battery out if the mete is not in use for long time.



VII. Other Items and Notes

1. Exclusiveness of Current Clamps
   There are two current clamps attached to every meter, which can not be exchanged for the other meters. Current clamps should be prevented from any crush and kept clean in order to ensure reliability when closing up to measure.
2. Maintenance of Current Clamps
   Please clean up clamp jaw surface after measurement, soft cloth dampened with lubricant (eg: WD-40 lubricant), not rough cloth or the corrosive is expected to use for the clearing. Please clean again just before use.
3. The meter can be used to measure secondary and low-voltage loops, however, not suggested to measure current in high-voltage circuits in case of electric shock.

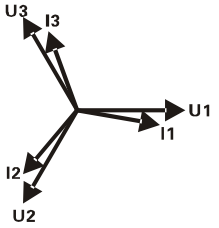
4. Three-Phase Four-Wire (phase angle under three-phase load balance)

Phase Relations	Phase Value	Phase Relations	Phase Value
Ua-Ub	120°	Ia-Ib	120°
Ub-Uc	120°	Ib-Ic	120°
Uc-Ua	120°	Ic-Ia	120°

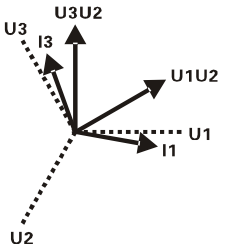
5. Three-phase Three-Wire (phase angle under three-phase load balance):

Phase Relations	Phase Value	Phase Relations	Phase Value
Uab-Ucb	300°	Ia-Ic	240°
Uab-Ia	30°	Ucb-Ic	330°

6. Three-Phase Four-Wire and Three-Phase Three-Wire Vector Diagrams



Three-Phase Four-Wire Vector Diagram



Three-Phase Three-Wire Vector Diagram

⚠ **Notes:**

If current clamps or current wires are incorrectly attached, the displayed phase difference will be 180°, that is to increment by 180° based on reference values above.

VIII. Product Contents

The Meter	1
Carrying Case	1
Current Clamps	2
System Software CD	1
RS232 Communication Line	1 (1.8 meters)
Test Leads	4PCS（red×2，black×2）
Battery	6 PCS（Alkaline Dry Battery：1.5V AA）
User Manual, Warranty Card, Certificate	1 set

The manual information is subject to changes without prior notice.

UT265B OPERATING MANUAL

UNI-T
UNI-TREND TECHNOLOGY（CHINA）CO., LTD.
No6, Gong Ye Bei 1st Road,
Songshan Lake National High-Tech Industrial
Development Zone, Dongguan City,
Guangdong Province, China
Tel: (86-769) 8572 3888
http://www.uni-trend.com