



Technical Data Sheet

DELTA 1000 AC / 400 AC



DELTA Clamp ES1000 AC / ES400 AC is a highly innovative design for features those increases safety and comfort of user. continuity test, Temperature measurement (PT100/PT1000), overload warning, Auto off Cat II/III.

Special Features

- Rotating clamp jaws facilitate the measurement at physically awkward positions, vertical bus bars, conductors placed at positions difficult to access.
- Clamp jaws can be opened or closed with the trigger placed at bottom side away from the jaws. This allows the user to place his/her hand at safer distance from live conductor. This greatly reduces exposure of human beings to electrical shocks
- Location and design of trigger eliminates fatigues caused by single finger operation. It allows spreading the force required to open the jaws over more than one finger to ensure comfortable operation.
- Comfortable operation of push buttons and function selector switch, in adverse field conditions.

Application

DELTA Clamp Es1000 AC/ES400 AC measures important electrical parameters like AC Current, AC Voltage, and DC Voltage. It also features Capacitance, Ohm & Continuity, frequency, and Duty cycle and temperature measurement.

Product Features

Large Jaw Opening

DELTA Clamp ES1000 AC Jaw opening of 51mm for standard wire diameter of 50mm and for DELTA Clamp ES400 AC Jaw opening of 41mm for standard wire diameter of 40mm for 400A

Narrow Body

Narrow housing for firm grip and easy to carry.

High Accuracy for low current measurement

The clamp meter can measure accurately at not only the High currents but also Low current ranges.

User selectable Backlit

It is possible to conduct measurement using the clamp meter during night time in darkness with the help of Backlit.

Temperature measurement

Temperature from 0 to 1300 °C using K type thermocouple sensors.

AUTO POWER OFF

In order to save the power of the Batteries, the clamp meter will automatically shut OFF if it detects no activity for 15 minutes.

Relative Measurement

By pressing REL key, the zero correction is made and relative value is measured. All functions can measure Relative value except Hz/Duty.

Hold Function

By pressing HOLD key reading on the display can be latched. Simultaneously HOLD is displayed on display.

Hz / Duty

The instrument can measure frequency (Hz) and Duty cycle (%) of AC voltage by pressing yellow key in VAC function.

NULL ZERO Correction for Resistance

For Low ohm measurement, the lead resistance can be compensated by pressing REL key.

Non contact voltage (NCV) detection

Presence of AC voltage >75 V AC 50/60 Hz can be detected by keeping jaws near voltage carrying conductor. It is indicated by beep sound.

AUTO and MANUAL ranging modes

In AUTO ranging mode the instrument automatically selects the range with best resolution depending on the applied input. In MANUAL ranging mode range is user selectable using MAN key.

Diode and continuity testing

For testing diode and transistors, diode measurement function is available. Continuity test generates beep sound if resistance is less than 75 ohm

Protection from dust and water

IP20 for terminals as per IEC60529

Applicable International Safety standards

600 V CAT III/1000V CAT II as per International Safety standard IEC 61010-1- 2010

Double molded Cover for soft touch and firm grip of the Instrument

Specifications

Meas. Function	Measuring Range	Resolution	Input Impedance	Intrinsic error of digital display at reference conditions ± (...% of rdg + ...digits)	Overload capacity ¹⁾	
			V(AC) / V(DC)		Overload value	Overload duration
V $\overline{\text{---}}$	400.0mV	100 μ V	>20G Ω	0.75+2	1050V(DC)	Continuous
	4.000V	1mV	11M Ω	0.5+2		
	40.00V	10mV	10M Ω			
	400.0V	100mV	10M Ω			
	1000V	1V	10M Ω			
V \sim	400.0mV	100mV	11M Ω	1.5+5 (>400 digits)	1050V(AC) rms	Continuous
	4.000V	1mV	11M Ω	1+5		
	40.00V	10mV	10M Ω			
	400.0V	100mV	10M Ω			
	1000V	1V	10M Ω			
A \sim Clamp meter 400A	40.00A	10mA	Open-circuit voltage	1.5 % of range +5 digits	480 A	Continuous
	400.0A	100mA		1.5 % of range +5 digits	1100A	Continuous
A \sim Clamp meter 1000A	400.0A	100mA				
	1000A	1A				
Ω	400.0 Ω	100m Ω	approx 0.45V	0.8+5	500V DC/AC rms	10 min
	4.000k Ω	1 Ω		0.8+2		
	40.00k Ω	10 Ω				
	400.0k Ω	100 Ω				
	4.000M Ω	1k Ω				
	40.00M Ω	10k Ω				
μ)	400.0 Ω	100m Ω	Acoustic signal for 0...<75 Ω (approx)			
F	1.000V	1mV	approx 1V	2+10	500V DC/AC rms	10 min
	5.000nF	1pF	3+40 ²⁾			
	50.00nF	10pF	2+10 ³⁾			
	500.0nF	100pF	0.5+3			
	5.000 μ F	1nF	1+2			
	50.00 μ F	10nF	1.5+2			
200.0 μ F	100nF	5+10 ⁴⁾				
Hz ³⁾	10.000Hz	0.001Hz	1Hz	0.2+2	≤1kHz : 1000V ≤10kHz : 400V ≤500kHz : 40V except 400mV	Continuous
	100.00Hz	0.01Hz	1Hz			
	1.0000kHz	0.1Hz	1Hz			
	10.000kHz	1Hz	1Hz			
	100.00kHz	10Hz	1Hz			
	500.0kHz	100Hz	1Hz			
%	2.0...98.0%	0.1%	---	10Hz...1kHz : ±5D 1kHz...10kHz : ±5D/kHz		
°C	0...+1300°C	1°C	Sensor K-type NiCr-Ni	2+3 ⁵⁾	500V DC/AC rms	10 min

- 1) At 0° + 40 °C
- 2) With zero adjustment, using REL key.
- 3) Indication of frequency measurement expanded to 9999 Digits.
- 4) Time required for measurement approximately 60 secs
- 5) Without sensor

Reference conditions for Accuracy

Reference temperature	23°C ± 2K
Relative Humidity	45%...55% RH
Waveform of measured quantity	Sinusoidal
Input frequency	50 or 60 Hz ±2%
Battery Voltage	3 V ± 0.1 V


Influence Quantities and Variations

Influence Variable	Influence Range	Meas. Magnitude/ Measuring Range	Influence Effect
Temperature	0 °C ... +21 °C and +25 °C ... +50 °C	V =	0.1 x intrinsic error / K
		V ~	
		A ~	
		Ω	
		F	
		Hz	
		Duty(%)	
		°C	

Influence of frequency on	Influence Range (max. resolution)	Frequency	Intrinsic Error at Ref. (± ...% of rdg. + ... D)
V _{AC}	4V, 40V, 400V	20 Hz ... < 50 Hz >60 Hz ... 1k Hz	2 + 3
	400 mV, 1000V	20 Hz ... <50 Hz >60 Hz ... 500 Hz	2 + 3

Influence Variable	Influence Range	Meas. Magnitude/ Measuring Range	Influence Effect
Relative Humidity	55 ... 75%	V ≈ A ~ Ω F Hz (%) °C	1 x intrinsic error

Battery voltage influence:

- (Without  display) - all ranges except capacitance: ± 8 Digits
- For capacitance ± 60 D at battery voltage 2.6V

Environmental

Operating temperature	-10 to +50°C
Storage temperature	-25 to +70°C
Relative humidity	45...75% non condensing
Terminal Protection	IP 52 for Housing and IP20 for terminals

Battery

Battery Voltage	1.5 x 2 V AAA size batteries
Battery type	zinc-carbon cell OR alkaline manganese cell per IEC 6LR 03
Battery Life	with zinc-carbon cell: approx. 200hrs with alkaline manganese cell: approx. 400 hrs

Display

Display/ Char. Height	7 segment digit/ 13mm
Number of Places	3 3/4 place \geq 3999 steps
Overflow Display	"OL"
Polarity Display	"-" sign is displayed when plus pole is at "1"
Measuring Rate	3 measurements/s

Applicable Standards

EMC Immunity:	IEC 61326-1:2012, Table A.1 IEC 61000-4-2 8 KV atmosphere discharge, 4 KV contact discharge IEC 61000-4-3 : 3 V/m
Note:	Short-term measured value deviation may occur during electro-magnetic interference thus reducing the specified operating quality.
Safety	IEC 61010-1-2010
IP for water & dust	IEC60529
Pollution degree	2
Installation category	600V CATIII / 1000V CATII
High Voltage Test	4.4 kV AC, 50Hz for 1 minute between housing and input.

Mechanical configurationn

Dimensions	90mm (W) x 270mm (L) x 70mm (H)
Weight	0.6 Kg



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