

# VOLTCRAFT

## VOLTCRAFT - RELIABLE AND PRECISE. SINCE 1982.

For more than 40 years, our product range has been dynamically adapting to the constant changes in the industry. We commit to offering first-class quality to our customers while delivering an excellent cost-performance ratio. This philosophy remains the cornerstone of Voltcraft's success.

## ET-400 INSULATION TESTER

Item no. 3414442

This versatile digital high-voltage insulation resistance tester is a diagnostic device for evaluating the insulation integrity of electrical equipment such as cables, motors, generators, and transformers.

### FEATURES

Four voltage ranges (250V, 500V, 1000V, 2500V) // 10% step fine-tuning // Stores 999 data groups // USB PC data transfer.

CE



## TECHNICAL DATA

### 1 Accuracy

|                               |                                                                                                                                                                        |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Error limit .....             | ± (a% of reading + b digits)                                                                                                                                           |
| Environment temperature ..... | 23 ± 5 °C                                                                                                                                                              |
| Environment humidity .....    | 45 – 75 % RH. In the table below: The humidity must be less than 50 % RH when testing insulation objects with a resistance greater than 50GO in the parameters.        |
| Temperature coefficient ..... | Test outside the temperature range of the indicator (i.e. above 28 degrees or below 18 degrees), with an additional testing error of +/-0.25% for each degree Celsius. |

### 2 Product

|                                                           |                                                                                                                                                                                  |
|-----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rechargeable battery .....                                | 14.8 V, 5200 mAh Li-ion rechargeable battery                                                                                                                                     |
| Rated voltage .....                                       | 250V, 500V, 1000V, 2500V                                                                                                                                                         |
| Output voltage accuracy .....                             | + (0%~20%)                                                                                                                                                                       |
| Insulation resistance range .....                         | 0.25MΩ~2.50TΩ                                                                                                                                                                    |
| Output short-circuit current .....                        | Approx. 5.0mA (10s)                                                                                                                                                              |
| Continuous insulation resistance measurement .....        | √ (default mode)                                                                                                                                                                 |
| Polarization index testing .....                          | √ (automatic display)                                                                                                                                                            |
| Absorption ratio testing .....                            | √ (automatic display)                                                                                                                                                            |
| Timing measurement .....                                  | √                                                                                                                                                                                |
| Resistance comparison measurement .....                   | √                                                                                                                                                                                |
| Voltage testing .....                                     | DC 30V~1000V; Accuracy: ±(3%+5)<br>AC 30V~750V; Accuracy: ±(3%+5)                                                                                                                |
| Capacitance testing .....                                 | Range: 0.01uF~2.00uF; Accuracy: ±(15%+3)                                                                                                                                         |
| Low resistance testing .....                              | Range: 0.1Ω~600Ω; Accuracy: ±(2%+10)                                                                                                                                             |
| Current display .....                                     | Current is displayed when measuring insulation resistance.                                                                                                                       |
| Voltage stepping .....                                    | 10% of the range. Range: 50 % - 120 %                                                                                                                                            |
| Monitoring live voltage of external measured object ..... | Monitor the voltage of measured object and the discharge state after testing. If voltage is higher than 36V, it is forbidden to test for protecting the tester and the operator. |
| Timer testing .....                                       | Record testing time automatically.<br>Timing range: 0s 99m and 59s.                                                                                                              |
| High voltage alarm .....                                  | The danger warning symbol flashes if safety voltage is exceeded.                                                                                                                 |
| Storage function .....                                    | Store 999 groups of data                                                                                                                                                         |
| Communication function .....                              | Upload testing data to computer (one-way) via USB cable.                                                                                                                         |
| Battery power indication .....                            | Indicate charging or replacing battery when low battery occurs.                                                                                                                  |
| Auto power off .....                                      | Power off automatically 15 minutes after the tester powers on (without occurrence of high voltage and operation).                                                                |
| Operating environment .....                               | 0 to +35 °C; < 75 % RH                                                                                                                                                           |
| Storage environment .....                                 | -20 to +60 °C; < 80 % RH                                                                                                                                                         |
| Altitude .....                                            | <2000 m                                                                                                                                                                          |
| Pollution degree .....                                    | 2                                                                                                                                                                                |
| CAT rating .....                                          | CAT IV 600V                                                                                                                                                                      |
| Safety standards .....                                    | IEC61010-1; EN IEC 61010-2-034; EN 61010-1; EN IEC 61010-2-034                                                                                                                   |
| Dimensions (L x W x D) .....                              | 230 x 161 x 90 mm                                                                                                                                                                |
| Weight .....                                              | Approx. 1800 g (including battery)                                                                                                                                               |

3 Power adaptor

|                                |                                                                    |
|--------------------------------|--------------------------------------------------------------------|
| Manufacturer                   | Conrad Electronic SE, Klaus-Conrad-Str. 1, 92240 Hirschau, Germany |
| Commercial Registration Number | HRB 3896                                                           |
| Model identifier               | LY036SPS-168200W2                                                  |
| Input voltage                  | 100–240 V/AC                                                       |
| Input AC frequency             | 50/60 Hz                                                           |
| Output voltage                 | 16.8 V/DC                                                          |
| Output current                 | 2.0 A                                                              |
| Output power                   | 33.6 W                                                             |
| Average active efficiency      | 87.8 %                                                             |
| Efficiency at low load (10%)   | 49.3 %                                                             |
| No load power consumption      | 0.08 W                                                             |

4 Insulation resistance specifications

| Rated voltage | Measurement range | Accuracy           |
|---------------|-------------------|--------------------|
| 250V          | <0.25MΩ           | For reference only |
|               | 0.25MΩ-4.99GΩ     | ± (5%+5)           |
|               | 5.00GΩ-49.9GΩ     | ± (20%+10)         |
|               | 50.0GΩ-250GΩ      | For reference only |

| Rated voltage | Measurement range | Accuracy           |
|---------------|-------------------|--------------------|
| 500V          | <0.50MΩ           | For reference only |
|               | 0.50MΩ-9.99GΩ     | ± (5%+5)           |
|               | 10.0GΩ-99.9GΩ     | ± (20%+10)         |
|               | 100GΩ-500GΩ       | For reference only |

| Rated voltage | Measurement range | Accuracy           |
|---------------|-------------------|--------------------|
| 1000V         | <1.00MQ           | For reference only |
|               | 1.00MQ-19.9GΩ     | ± (5%+5)           |
|               | 20.0GΩ-199GΩ      | ± (20%+10)         |
|               | 200GΩ-1.00TΩ      | For reference only |

| Rated voltage | Measurement range | Accuracy           |
|---------------|-------------------|--------------------|
| 2500V         | <2.50MΩ           | For reference only |
|               | 2.50MΩ-49.9GΩ     | ± (5%+5)           |
|               | 50.0GΩ-499GΩ      | ± (20%+10)         |
|               | 500GΩ-2.50TΩ      | For reference only |

Short-circuit current, approx. 5.0mA current with load: 1mA~1.2mA (250V, 0.25MΩ; 500V, 0.5MΩ; 1000V, 1.0MΩ; 2500V, 2.5MΩ;

Over-range indication: >

1 TΩ (Tera ohm) =1000GΩ=10<sup>12</sup>Ω

1 GΩ (Giga ohm) =1000MΩ=109Ω

1 MΩ (Mega ohm) =1000KΩ=106Ω

**Note:** For insulation resistance measurement, if the measured capacitive reactance is greater than approx. 100nF, it may cause reading to fluctuate significantly.

5 Current specifications

| Measurement accuracy | Display accuracy           | Range         |
|----------------------|----------------------------|---------------|
| ±(10%+5)             | 0.01nA<br>0.01μA<br>0.01mA | 0.01nA-5.00mA |

**Remark:** Test stops automatically if current remains at ≥1.00mA for 10s

6 Output voltage specifications

| Rated voltage | Output accuracy | Display accuracy | Output voltage |
|---------------|-----------------|------------------|----------------|
| 250V          | +(0%~20%)       | 1V               | 250V-300V      |
| 500V          |                 |                  | 500V-600V      |
| 1000V         |                 |                  | 1000V-1200V    |
| 2500V         |                 |                  | 2500V-3000V    |

**Remark:**

- Voltage adjustment range with step set at 10%: (50% 120%)
- 250V cannot step down and 2500V cannot step up.

7 Low resistance testing specifications

| Function                   | Measurement range | Accuracy  |
|----------------------------|-------------------|-----------|
| Low resistance measurement | 0.1Ω-600Ω         | ± (2%+10) |

**Remark:** Open-circuit voltage: 5V

**Note:** If the measured resistance is ≤20Ω, the buzzer alarms; if >660Ω, “>660Ω” is displayed. The short-circuit current is >200mA.

8 Voltage testing specifications

| Voltage measurement | Measurement range | Accuracy | Resolution |
|---------------------|-------------------|----------|------------|
| DC voltage          | 30-1000VDC        | ±(3%+5)  | 1V         |
| AC voltage          | 30-750VAC         | ±(3%+5)  | 1V         |

**Remark:**

1. Input impedance: 200MΩ

2. Frequency: 50Hz / 60Hz

Over-range indication: “OL”

**Note:** LO is displayed if the input voltage is less than approx. 25V; the reading flashes if the input voltage is between approx. 750VAC~824VAC or 1000VDC~1099VDC; “OL” is displayed with buzzer making sound and LCD flashing if the input voltage is greater than approx. 1100VDC or approx. 825VAC.

9 Capacitance testing specifications

| Function                | Measurement range | Accuracy  |
|-------------------------|-------------------|-----------|
| Capacitance measurement | 0.01uF~2.00uF     | ± (15%+3) |

**Remark:** Note the withstand voltage of capacitance (≤1000V)

**Note:** Rated voltages for capacitance measurement include 250V, 500V, and 1000V. LO is displayed if measured capacitance is < 0.01uF; OL is displayed if measured capacitance is >2.20uF. If capacitance over 2.2uF is measured when the battery power indicator shows one “segment” of lower left, the tester may enable battery protection, in such case, please charge the tester to activate the battery.