Zensol

AC Current Probe

Ref: CT-CLAMP-AC

General Description

The Zensol CT-CLAMP-AC clamp is an AC current probe operating on the current transformer principle. Unlike standard passive probes that require an external load, it integrates an internal conversion circuit directly delivering an AC voltage signal (mV AC) proportional to the measured current. This architecture facilitates its direct interfacing with data acquisition systems or high-impedance measuring instruments.

1. Ranges and Sensitivity

- **20 A Range:** 100 mV / A output (operating range: 0.5 to 24 A AC). Typical accuracy is 1.0% of the reading.
- **200 A Range:** 10 mV / A output (operating range: 0.5 to 240 A AC). Accuracy varies from 1.0% to 3.0% depending on the current.
- **Overload Capacity:** The magnetic circuit tolerates a current of 240 A for 10 consecutive minutes, requiring a 30-minute rest period afterward.

2. Dynamic Characteristics

- **Bandwidth:** 40 Hz to 10 kHz, allowing analysis of the fundamental frequency as well as harmonics and slow transients.
- **Phase Shift (Angular Drift):** On the 200 A range, maximum phase shift is guaranteed ≤ 3.0° between 10 and 40 A, and ≤ 2.5° between 100 and 240 A. Accounting for this parameter is critical when designing temporal analysis chains or for power calculations.

3. Ergonomics and Mechanical Design

- **Clamping Capacity:** The 21 mm (0.83") opening allows isolating a conductor up to 20 mm in diameter or a 20 x 5 mm busbar. The beveled hook profile is designed to facilitate insertion into dense cable bundles.
- **Materials:** The housing is made of durable polycarbonate (UL 94 V0 rated, with 10% fiberglass in the jaws) and assembled by ultrasonic welding, ensuring excellent mechanical resistance for field interventions.

4. Connectivity

- **Acquisition Interface:** The signal is transmitted via an integrated 1.5 m double-insulated cable, terminated by 4 mm safety male banana plugs. For integration into industrial diagnostic systems where anti-disconnection safety is a priority, it is advisable to provide adapters allowing a transition to lockable panel receptacles (e.g., robust 4-pin connectors).

5. Standards & Industry Compliance

This probe is designed and tested to meet stringent international standards, ensuring reliability and safety for critical power utility applications:

- **IEC/EN 61010-1 & 61010-2-032:** Strict safety standards governing portable current sensors, guaranteeing double insulation and 600 V CAT III protection category.
- **EN 61326-1 / IEC 61326-1:** Electromagnetic Compatibility (EMC) standards ensuring high immunity to electrical noise in high-voltage substation environments.
- **RoHS & CE Directives:** Fully compliant with environmental safety and European conformity requirements.

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