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LEM's CTSR current transducers combine safety and high performance in solar installations

Key points:

- Accurate current measurement of few hundred milliamps**
- Large conductor aperture of 20.1 mm diameter**
- Creepage and clearance distances up to 11 mm for high insulation**
- Operating temperature range spans -40 to +105°C**

LEM has introduced the CTSR family of current transducers for use in a range of safety-critical applications including solar installations. Two transducers in the new series measure AC or DC leakage nominal currents, from values as small as 300 and 600 mA_{RMS}, with spectral components up to 9.5 kHz. The residual or leakage currents that the CTSR family is designed to measure can arise in fault conditions in a number of industrial or power-generation scenarios. Examples include solar panels that are coupled to an earthed grid, or in failure modes such as a short circuits or earth faults. The connection of a solar panel to the grid raises safety concerns; if a fault occurs there is a potentially serious safety issue around any human contact with the system.

The CTSR family of transducers has been specifically designed to meet the latest safety standards that have been issued in respect of solar installations and inverters, namely VDE 0126-1-1, UL 1741, and IEC 60950-1. The devices are PCB mountable, lightweight (28g) components, with a 20.1 mm diameter aperture that easily accommodates multiple conductors. The residual-current capability measures the sum of all of the instantaneous currents flowing through the aperture, in single- or three-phase configurations. Conductors may be carrying primary currents of up to 30A/wire (AC or DC).

The CTSR 0.3-P and CTSR 0.6-P safely measure nominal currents of 300 and 600 mA respectively, to a maximum accuracy of 1.9% and 1.5% respectively at +25°C ambient temperature, without offset, providing an analogue output to trigger a safety system in the event of a high leakage current. They both provide a high overload capability up to 3300A (for a pulse duration of 100µs, and with risetime of 500 A/µs), as well as a very high level of insulation between primary and measurement circuits, thanks to long creepage and clearance distances (11 mm), coupled with a CTI (comparative tracking index) of 600V.

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These products can also be supplied with a primary inserted conductor (made up of 4 individual conductors), and in that configuration have the designation “CTSR xxx-TP”.

CTSR-series transducers operate from a +5VDC supply and have a typical current consumption of just 17.8 and 18.1 mA unipolar when measuring 300 and 600 mA respectively as nominal primary residual current (CTSR 0.3-P and CTSR 0.6-P models); They provide access to their internal reference voltage, and to options such as self test and demagnetisation.

Models with higher nominal current range up to 3 A_{RMS} to meet the needs of specific customers can be developed on request.

As well as ensuring safety in solar inverter installations, LEM’s CTSR range is also ideal for a range of applications that includes symmetry fault detection in medium power inverters, failure detection in a range of power sources.

The transducers are CE marked, conform to the EN 50178 standard and are recognised for industrial applications with an operating temperature range of -40 to +105°C. LEM offers a five-year warranty for each transducer.

LEM – At the heart of power electronics

LEM is the global leader in providing innovative and high quality solutions for measuring electrical parameters. Its current and voltage transducers are used in a broad range of applications in industrial, traction, energy & automation and automotive markets. LEM is a high growth global company with approximately 1000 employees worldwide. It has production plants in Geneva (Switzerland), Copenhagen (Denmark), Machida (Japan), Beijing (China) and regional sales offices close to its customer’s locations. LEM has been listed on the SIX Swiss Exchange since 1986; the company’s ticker symbol is LEHN.

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