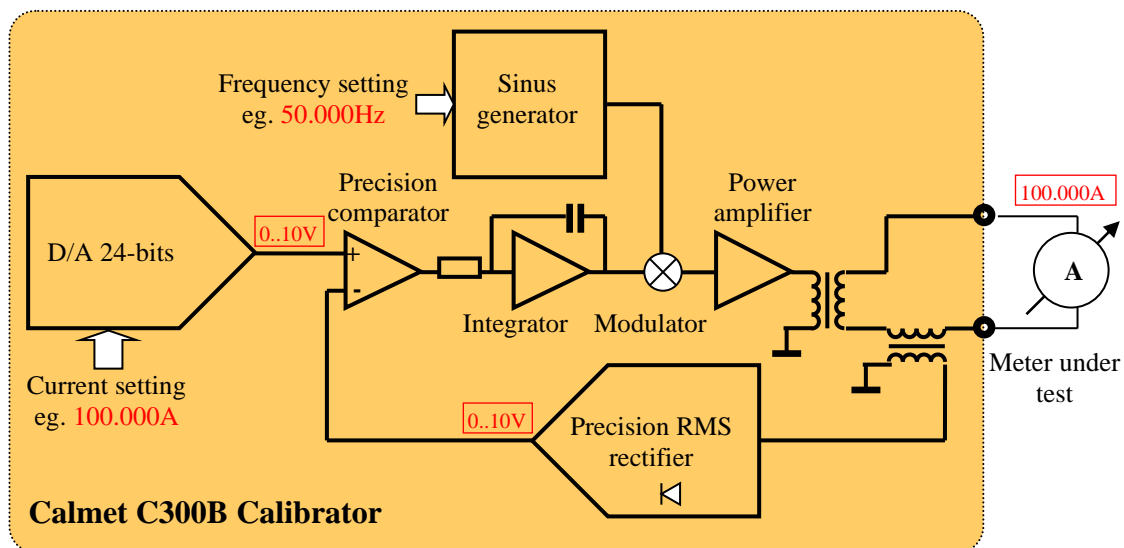
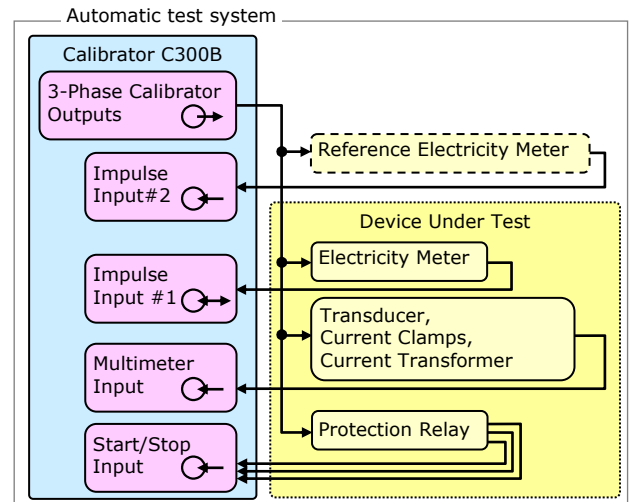
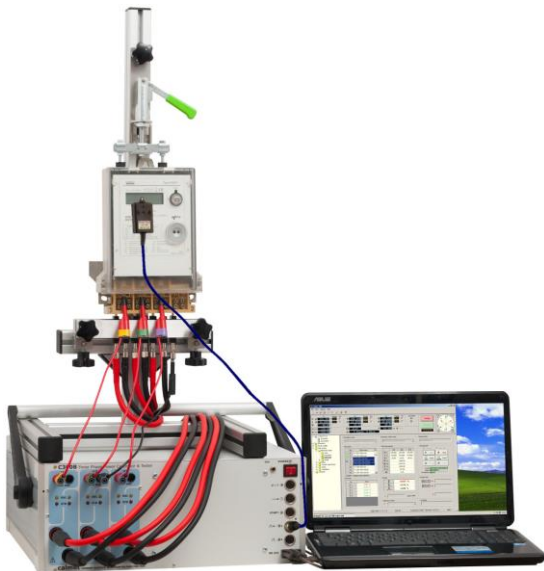


Calmet C300B 3-Phase Power Calibrator

- General Principle of Operation

Application Note No19



A simplified diagram of the Calmet C300B power calibrator – one current channel

The Calmet C300B 3-phase power calibrator is controlled via the RS232/USB interface using the dedicated PC software Calpro300. All settings are transferred to the C300B to obtain the required output signal values.

The idea of the calibrator is presented on the basis of the one current channel of the C300B. The set value of frequency is transferred to the sine generator, and the set value of current (e.g., 100.000A) is transferred from the computer to the calibrator, and then to a 24-bit precision D/A (digital-to-analog) converter, which converts it to the voltage in the range of 0..10V. At the same time, the sinusoidal signal from the generator passes through the modulator to the power amplifier and then to the current transformer, which provides an output current to the calibrator terminals. The output current is controlled by a second precision current transformer. The signal from this transformer is rectified (RMS - root mean square) to the DC on level 0..10V. This DC voltage is compared with the set value of voltage from the D/A converter and the result of the comparison drives the integrator, which controls the modulator of the sinusoidal signal. This provides a feedback loop for the precise control of the calibrator output value. Additionally, the output value does not depend on the load change, time, or temperature, and is stable within the defined accuracy limits. As a result, the meter under test detects the exact same set value.

For example, the set value of 100.000A is converted by the D/A converter and then stabilized at the output with an accuracy of $\pm 0.02\%$, which is $100.000A \pm 0.020A$. When the user sets and views a value of 100.000A on the display, they can be confident that the output signal will fall within the range of 99.980A...100.020A, which fits with the accuracy class of the calibrator.

The value of internal signals (0..10V) from D/A or RMS does not matter as the adjustment of the calibrator during the process of calibration is made by measuring the output value by using a higher-level reference standard against the set value in the calibrator through PC software.

The C300B Calibrator and Tester is a 3-phase AC voltage and current source with an accuracy class of 0.02%. To learn more about the C300B Calibrator, visit us at <http://www.calmet.com.pl>