Position Indicator for Load Tap Changers

A Weschler Digital Bargraph meter can be used to indicate Load Tap Changer position on a utility power transformer. The LTC adjusts the transformer voltage in discrete steps, to compensate for line or load changes. Nominal position is at the center of the step range. To remotely display tap position, some LTCs provide a low voltage DC output from a resistive divider or potentiometer. As the tap changer moves to a different step, it selects the corresponding point on the divider. Alternatively, the LTC may have a quadrature encoder or rotary transducer to sense position.

The Bargraph meter is configured to provide both a numeric step value and a bar indication of relative position. Limits can be established to warn when the LTC goes above or below specific taps (as shown in the second photo). The bar changes color to call attention to this condition and a relay closes to activate an external alarm.

Meters with a circular bar (as shown here) or straight bar (as shown below) are available, in sizes up to 10”. The dial and setup are customized for the number of steps and step voltages on a specific LTC. The meter can be ordered with sensor excitation to drive the resistive divider. A digital communications option interfaces to the facility's data network.

Customize Readout with Non-Linear Table

The table function used in the Tap Position Indicator (above) is adaptable to a variety of non-linear applications. A sensor with a non-linear output can be corrected using one of the 32 point tables in the Premo Bargraph meter. Data on up to 4 sensors can be stored in memory or the tables can be cascaded for precise 128 point correction of a single sensor.

Tank level is another popular use for the table function. Level in an irregular shaped tank does not indicate the amount of fluid in the tank. The table values correct the reading based on volume below each level. The bar and digital display can track or show different info. For example, the bar could display liquid level (like a sight gauge) while the digital shows number of gallons held in the tank. The Premo Meters can also apply square root, inverse and ratio calculations to either value. The table function is included on all Premo & Tricolor Digital Bargraph meters.
Accuenergy Power Meter

The Acuvim-L is economical choice for monitoring and control of power distribution systems. The L series offers multi-function TRMS measurements, 4 quadrant energy, power quality analysis, demand and over/under limit alarms. These meters fit both 92x92 DIN and 4” ANSI round panel cutouts. The wide operating temperature range (-25 to +70degC) is suitable for both control room and control cabinet installation. RS485 Modbus digital communications is optional. The EL model includes Time-of-Use with 4 tariffs, 12 seasons & 14 schedules.

The quality of the power system is important with increasing use of electronic loads such as computers, ballasts & variable frequency drives. With the Acuvim-L power analysis option, any phase current or voltage can be displayed and the harmonic content calculated. Action can then be taken to prevent overheated transformers, motors, capacitors or neutral wires and nuisance breaker trips.

For more demanding applications, the Acuvim II provides a 5 parameter display, revenue grade metering, ethernet interface, data logging and plug-in modules for additional I/O.

Current Transformers vs. Current Transducers

The Current Transformer (CT) is used to sense AC current in single-phase or three-phase mains circuits. The CT typically has a 1A or 5A AC secondary that connects to a current, power or energy meter. This allows the meter to be located away from the mains wiring. CTs are available in a variety of sizes and styles, with standard ratios of 50:5 to 4000:5. Split core models easily retrofit around existing wiring. Solid core models offer lower cost.

Some monitoring systems are supplied with current transformers that have a voltage output. The full scale on these devices is not standardized, but usually is between 0.3-2V AC. Despite the lack of standardization, there are several advantages to using a CT with a voltage output. It eliminates the need for heavy leads or a high VA rating. The voltage output also allows a greater distance between the CT and the meter. Another consideration - an open secondary loop on a 1A or 5A CT can produce hazardous high voltage. Models with a voltage output are clamped to a safe level.

Current Transducers also use a solid-core or split core transformer to sense an AC current. However they have circuitry to convert the output to a low level DC signal, either volts or mA. Models with a DC voltage or 1mA current output may be self-powered. Models with a 4-20mA DC output usually require an external power supply.

See product info for Current Transformers or AC Current Transducers. The CT Application Notes have guidelines for specifying a current transformer.