



SEL-734 Meter Guideform Specification

The meter shall be microprocessor-based with a combination of recording, automation, and communication capabilities. The meter shall include self-diagnostic functions to alarm upon detected failure. Specific requirements are as follows.

Accuracy. The meter shall conform to requirements for 0.2 accuracy class. These requirements are defined by ANSI C12.20-2002.

True Four Quadrant. The meter shall measure kilowatt hours delivered or received, as well as kilovar hours leading and lagging for power delivered and received.

Recording. The meter shall include 12 channels of programmable recording. Memory shall be of sufficient size to record 12 channels at 5-minute intervals with at least 35 days before the earliest interval is overwritten. The memory shall be dynamically configured such that a reduction in number of recorded channels, or an increase in interval time, shall increase the number of days before memory overwrite.

Transformer/Line Loss Compensation. The meter shall include a provision for necessary calculations to compensate for meter locations remote from billing points. Compensation shall be either positive or negative and include factors for both excitation and loading losses in the transformer.

Minimum/Maximum Recording. Each phase voltage and current shall have the date and time of the last maximum and minimum value since resetting the maximum/minimum. Three-phase real and reactive power as well as the date and time of the reset shall also be recorded.

Voltage Sag/Swell Recording. A record shall be available of voltage excursions outside of a preset band around nominal voltage setting. Record intervals shall be adaptive, changing from one value recorded per quarter cycle, up to once per day, to prevent overwriting recordings before the end of the voltage excursion.

Waveform Capture. The meter shall include high-resolution (128 samples per cycle) waveform capture. In addition, four 15-cycle events shall be stored in nonvolatile memory.

Human Machine Interface. The meter shall include a configurable front display including programmable display points on a LCD screen, 6 programmable LED indicators plus ENABLED LED, with configurable slide-in labels.

Harmonic Metering. The meter shall have individual harmonic values, up to the 15th harmonic, and total harmonic distortion, calculated from up to the 50th harmonic, available for recording or control purposes. Crest factor (peak divided by rms) values shall also be available.

Inputs and Outputs. The meter shall support digital inputs and electromechanical, solid-state, or analog outputs.

K-Factor Calculation. The meter shall perform K-factor calculations for transformer loading, as defined by IEEE transformer loading guides. The calculated K-factor shall be available for use in alarm or control equations.

Synchronized Phasor Measurements. The meter shall provide high-accuracy phasor measurements for voltages and currents if an IRIG-B signal is available. The synchrophasor shall be available using unsolicited binary messages with selectable update rates of 1–20 times per second.

Analog and Math Logic. The meter shall have logic available for use in programming contacts or digital outputs. The logic shall use any internal meter logic point for Boolean logic calculations as well as having metered values available for use in mathematical functions. Boolean logic shall include AND, OR, NOT, rising edge detection, falling edge detection, as well as latches and counters. Math functions shall include add, subtract, multiply, and divide as well as analog compare functions.

Predictive Demand. The meter shall include a function to determine that the demand for a fixed interval will be above a set value. This determination shall be available for use in internal logic to alarm or send a digital signal.

Communications. The meter shall include a front optical port and a rear serial port as standard. Optional ports shall include a telephone modem, an additional EIA-485 serial port, EIA-232 serial port and Ethernet port. Serial ports shall support digital communications of internal logical points to two other meters, relays, or communications or logic processors.

Protocols. The meter shall support DNP3, Modbus, Telnet, ASCII, and binary interleaved communications protocols. The meter shall be programmed with and communicate using both a graphical user interface or ASCII text over a terminal emulation system.

Time-of-Use Metering. The meter shall include a provision for recording demand and energy consumption during different periods based on a user-defined calendar. Programming will allow for 4 Seasons, 6 Rates, 10 Day Types, 40 rate schedules, 20-year calendar, and 6 Self Reads.

Temperature. The meter shall function for an ambient temperature ranging from -40° to $+85^{\circ}\text{C}$.

Warranty. The meter shall include a 10-year warranty.

