

Measure 10: Power Conditions Devices PCD-E

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Required Parameters	M&V Guidelines
Existing System Description	This procedure addresses the application of power conditioning devices that are connected either directly at end-use equipment or at a distribution panel or service entrance serving multiple end use loads and/or circuits.
Proposed System Description	<p>Power conditioning devices are employed to provide operational benefits and cost savings through techniques such as voltage regulation, power factor correction, reduction of harmonic content, and elimination of electrical transients.</p> <p>While tangible operational benefits can result from employing such devices, it must be noted that the Equipment Replacement Incentive Initiative 2015 – 2020 only provides incentives for quantifiable energy reductions and/or peak demand reductions measured as real power (kW) or energy (kWh). To confirm, savings in reactive power (kVar) or apparent power (kVA) are not eligible for incentives.</p> <p>Savings attributable to the application of power conditioning equipment are considered to be specific to the end use equipment and its operating characteristics, and the local electrical environment.</p> <p>An ideal M&V approach is to assess the energy usage of given end-use equipment, both with and without the application of the power conditioning device, under identical operating conditions.</p> <p>In practice, comparing under identical operating conditions may not be practical due to normal variations in equipment loading and electrical supply conditions.</p> <p>Recognizing this inherent variability, the M&V procedure for Power Conditioning Devices is designed to minimize the effects of variability by employing successive measurements with the power conditioning device activated and not activated (i.e. 'On-Off') over a period of time.</p>
Measurement Boundaries	Adhere to the principles described in the IPMVP Core Concepts
Measurement Conditions	Adhere to the principles described in the IPMVP Core Concepts
Sampling	Where multiple Power Conditioning Devices are employed the sample size for measurement shall be 20% of the equipment operating under like conditions.
Baseline Period and Reporting Period Duration	Adhere to the principles described in the IPMVP Core Concepts
Metering Requirements	<p>Specific procedures are as follows:</p> <p>Measurements of real power (kW) shall be taken with a three-phase power analyzer capable of recording at a minimum of 128 samples per cycle, and calibrated to within +/- 1% of reading accuracy.</p> <p>Measurements shall be taken on the load that is subject to the application of the power condition device under typical operating conditions, with a minimum of expected variability.</p> <p>Measurements shall be recorded for successive 15 minute intervals of the power conditioning device being activated and not activated. These recordings shall occur over a period of a</p>

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	minimum of 4 hours duration, over which time there shall be a minimum of 8 fifteen minute periods of the power conditioning device being both activated and not activated.
Demand Savings Calculation	Demand (kW) Savings, if they are to be considered, shall be assessed as the difference in average demand in each of the 'on' and 'off' recorded intervals. Average demand is to be calculated as total cumulative energy in kWh divided by total hours for intervals in which the power conditioning device is activated, and not activated, respectively. Note that for demand savings to be considered the measurements shall be taken on business days during the hours of 1 p.m. to 7 p.m. June 1 through September 30 and the application must be considered to be operating routinely during such times. Refer to the demand savings definition on Page 3.
Energy Saving Calculation	Energy (kWh) Savings for the measurement period shall be assessed as the difference between the cumulative recorded energy in each of the 'on' and 'off' intervals. Annual energy savings shall be considered as the % energy savings during the measurement period multiplied by the annual consumption of the measured circuit/application. Annual consumption can be estimated by extrapolating from recorded energy usage of minimum 1 week duration.
Baseline Adjustments	Adhere to the principles described in the IPMVP Core Concepts