

	DEPARTMENT OF COMMERCE National Institute of Standards and Technology National Voluntary Laboratory Accreditation Program	ISSUE DATE: August 9, 2023
	LAB BULLETIN	NUMBER: LB-152-2023
		LAP: Efficiency of Electric Motors LAP
SUBJECT: Calibration of Phase in Power Meters		

The purpose of this bulletin is to notify motors laboratories of phase calibration requirements for power meters.

Phase calibration is an important aspect of power meter calibration. Some calibrations indicate direct calibration of phase angle and others indicate calibration of power and power factor. Calibration certificates that indicate phase calibration at a single angle (commonly zero degrees) or power factor at a single value (commonly $PF = 1$) are not acceptable. Since power factor is a cosine function, an error in phase at zero degrees will be minimal compared to any error in the voltage and current measurements. At 90 degrees or $PF = 0$, an error in phase becomes more obvious. For example, an equipment manufacturer calibrates power meters at zero degrees as well as both a lead and lag of 90 degrees, and ANSI C12 requires calibration at both zero and -60 degrees.

To summarize, the methods for which NVLAP accredits do not include requirements for specific phase angles or power factors for calibration. Therefore, NVLAP is not stating which additional phase angles or power factors must be included in calibration. However, calibration at a single phase angle of zero degrees or $PF = 1$ is not acceptable, and some examples of additional parameters have been given above.

For one year from the issuance of this lab bulletin assessors will cite a comment when an unacceptable calibration is found. After one year, assessors will cite a nonconformity.

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