

A guide to U.S. metering requirements

NIST Handbook 44 and NTEP/CTEP Certifications

U.S. metering certification programs aim to provide EV drivers a consistent user experience that includes price accuracy and transparency. This white paper details the metering requirements for dispensing electricity via EV charging supply equipment across the United States.



ABB E-mobility chargers that enable NEVI programs are certified under NTEP and CTEP programs.

Overview

The National Institute of Standards and Technology (NIST) Handbook 44 (HB 44): Specifications, Tolerances and Other Technical Requirements for Weighing and Measuring Devices provides metering, price transparency and display requirements for fueling pumps and electric vehicle supply equipment (EVSE) that process commercial transactions.

Commercial transactions are: A sale of electricity dispensed to a customer in a vehicle fueling application. In a commercial transaction, an EVSE must show the amount of electricity dispensed, the unit price, and the total price charged.

Although NIST is a US Government agency, Handbook 44 is not Federally required; rather, NIST developed Handbook 44 to support the National Conference on Weights and Measures (NCWM). NCWM adopts HB 44 at an annual members' meeting which then becomes blueprint for implementation and enforcement of HB 44 by individual states. NCWM also administers the National Type Evaluation Program (NTEP) which provides certifications to EVSE manufacturers and operators that HB 44, as adopted by NCWM, has been properly implemented.

NTEP certificates are issued after EVSE devices have been witness tested by NTEP officials in approved laboratory conditions for compliance with the specification, tolerance, and technical requirements from NIST HB 44. Currently, ABB's Terra 184 and Terra 124 are NTEP certified.

What does HB 44 regulate?

The main goal of HB 44 is foster confidence in the fueling marketplace by ensuring that customers received the amount of fuel or electricity that they paid for. HB 44 does this by requiring that accurate measurement and metering devices are used to tally the amount of fuel or electricity provided. It further requires that EVSEs display the real time unit cost of electrical energy being charged to customers to provide pricing transparency. The performance requirements in HB44 include accuracy levels of the measuring devices or systems and testing methodologies to ensure that they meet the specifications and tolerances as prescribed.



Commercial transactions are: the sale of electricity dispensed to a customer in a vehicle fueling application. In a commercial transaction, an EVSE must show the amount of electricity dispensed, the unit price, and the total price charged.

When does HB 44 apply?

HB 44 typically applies to any EVSE that collects payment based on the amount of electricity (kWh) dispensed. The reason for this requirement is to ensure that individuals, companies, or entities are accurately charged for the amount of electricity they were provided by another. HB 44 does not apply in circumstances where entities are not charged based on the amount of electricity they were provided.

The graphic below illustrates examples of when HB 44 would apply and would not apply to EV charging sites.



HB 44 APPLIES

- **Public Charging for Consumers**
A driver uses an EVSE at a shopping mall, convenience store, or highway, and pays the operator of the charger based on the amount of electricity (kWh) dispensed. Payment could have occurred via credit card, phone app, or via “plug and charge.”
- **Public Charging for Fleets**
A driver or operator of a fleet vehicle, whether a truck, van, or light duty vehicle, pays a charging operator based on the amount of electricity (kWh) dispensed.
- **“Charging as a Service” Pay as you go**
A fleet operator contracts with a third-party company to provide EVs for it to use including the electrical fuel. The fleet operator pays that company a fee that fluctuates based on the amount of electricity (kWh) the fleet operator uses.



HB 44 DOES NOT APPLY

- **Free Public or Workplace Charging**
A driver uses a public EVSE, but the operator does not charge the driver a fee based on the amount of electricity provided.
- **“Behind the Fence” Charging**
A vehicle or truck owner or operator receives electricity from EVSE that it owns or operates, but does not require payment for the amount of electricity provided.
- **“Fleet/Charging as a Service” Flat Fee**
A vehicle or fleet operator contracts with a third-party commercial entity to provide electric vehicles for it to use including the electrical fuel. The fleet operator pays the commercial entity a flat set fee for the use of those vehicles regardless of the amount of electricity (kWh) the fleet operator uses.

State adoption and implementation of NIST HB 44

Adoption of HB 44 by the NCWM is not sufficient for creating a legally binding regulation. Rather, individual states must adopt and implement HB 44. There are three main ways this happens:

1. Automatic adoption of NCWM vote

The most common way that states adopt HB 44 is through legislation that is already law, which automatically adopts the decisions of NCWM. However, while adoption of the rules may be automatic, establishing and funding an implementation regime may not be. And in some of these states, the annual state budget must provide funding to staff and administer a certification and inspection program. Examples of states that automatically adopt updated HB 44 on an annual basis include Alabama, Arkansas, Connecticut, Delaware, Nevada, and Washington.

2. Adoption of NCWM vote

Some states require separate legislation adopting HB 44 as agreed by the NCWM. Examples of states that adopt HB 44 by a vote include Arizona, Indiana, Iowa, and Oregon.

3. Establish HB 44 rulemaking

Some states open their own separate administrative rulemaking process to establish their own version of HB 44. This pathway is typically undertaken by states that have the technical resources and capacity in their own weights and measures agencies. California was the first state to open and finalize a rulemaking on HB 44. California's rule, which deviates in some significant ways from HB 44 as adopted by NIST and NCWM went into effect on January 1, 2023. Other state that are embarking on their own rulemaking include: Texas, Florida, Minnesota, and New York.

Testing program

Most states rely on the NCWM's NTEP-authorized laboratories in North America to verify compliance and issue certificates. California is one of the few states that maintains its own laboratory testing program, called the California Type Evaluation Program (CTEP). The following states and organizations have NTEP approved testing and certification capabilities:

- California Division of Measurement Standards
- Federal Grain Inspection Service
- Kansas Department of Agriculture
- Maryland Department of Agriculture
- Measurement Canada
- NIST Force Group
- New York State Bureau of Weights and Measures
- North Carolina Department of Agriculture
- Ohio Department of Agriculture
- Oregon Department of Agriculture



NTEP AND CTEP CERTIFICATION

In a commercial transaction, the charger must show the amount of electricity dispensed, the unit price, and the total price charged.

ABB E-mobility's Terra 184 and Terra 124 are already CTEP and NTEP certified.

ABB E-mobility holds CTEP and NTEP (23-045P) certifications for the Terra 184 and Terra 124 DC fast charger models. As these chargers have received both CTEP and NTEP certificates, the NTEP certificate takes precedence.

HB 44 adoption practice

Automatic adoption Need vote to adopt Establish rule making

Is HB 44 required in my state or territory?

HB 44 is typically adopted in all 50 states, but the timing of implementation and enforcement of its requirements vary between states. The table below shows how states and territories adopt HB 44. States that automatically adopt the updated HB 44 will require compliance with EVSE metering requirements on January 1, 2025. For states that need a vote or have established rule making, there is potential for deviation of both requirements and effective dates. Below are some states that either require compliance with HB 44 or are in the process of setting HB 44 requirements.

State/Territory

Alabama	X		
Alaska	X		
Arizona		X	
Arkansas	X		
California			X
Colorado	X		
Connecticut	X		
Delaware	X		
District of Columbia		X	
Florida			X
Georgia	X		
Hawaii		X	
Idaho	X		
Illinois	X		
Indiana		X	
Iowa		X	
Kansas		X	
Kentucky	X		
Louisiana	X		
Maine	X		
Maryland	X		
Massachusetts	X		
Michigan			X
Minnesota			X
Mississippi	X		
Missouri	X		
Montana		X	
Nebraska		X	
Nevada	X		
New Hampshire	X		
New Jersey	X		
New Mexico	X		
New York			X
North Carolina	X		
North Dakota			X
Ohio		X	
Oklahoma	X		
Oregon			X
Pennsylvania	X		
Puerto Rico	X		
Rhode Island	X		
South Carolina	X		
South Dakota		X	
Tennessee	X		
Texas			X
Utah	X		
Vermont	X		
Virginia	X		
Virgin Islands	X		
Washington		X	
West Virginia	X		
Wisconsin		X	
Wyoming		X	

— The table on the right reflects the current adoption status of HB44 in each U.S. state and territory.



The main goal of HB 44 is foster confidence in the fueling marketplace by ensuring that customers received the amount of fuel or electricity that they paid for.

State-specific guidance

Some states have issued specific guidance on compliance with CTEP and/or NTEP.

California

Compliance with CTEP is currently required in California.

All DC EVSE used for commercial purposes shall comply with all requirements of this article in accordance with the following:

- All DC EVSE installed prior to January 1, 2023, shall comply with the requirements of this article by January 1, 2033.
- All DC EVSE installed on or after January 1, 2023, shall comply with the requirements of this article upon installation.

All AC EVSE used for commercial purposes shall comply with all requirements of this article in accordance with the following:

- All AC EVSE installed prior to January 1, 2021, shall comply with the requirements of this article by January 1, 2031.
- All AC EVSE installed on or after January 1, 2021, shall comply with the requirements of this article upon installation.

Oklahoma

Compliance is required beginning January 31, 2024

For publicly available charging stations that require payment and with a charging capacity of 50 or more kW:

- Beginning on January 31, 2024, for all public charging stations that began operations on or after January 31, 2024.
- Beginning on November 1, 2041, for all public charging stations that began operations prior to November 1, 2021.
- Beginning on January 31, 2028, for all public charging stations that began operations on or after November 1, 2021, and prior to January 31, 2024.

Washington

Compliance is required beginning January 1, 2024

- Any publicly available EVSE installed and placed into service before January 1, 2024, is exempt until January 1, 2034.
- Any publicly available EVSE installed and place into service on or after January 1, 2024, shall comply upon installation.



ABB E-mobility's NEVI-enabled charging solutions meet the needs of charging sites across the United States. Program and offering details can be found in our NEVI Guide.



To learn more about charging deployment strategies that meet EV driver expectations while supporting operational goals, please read the ABB E-mobility white paper, "Charger reliability best practices."

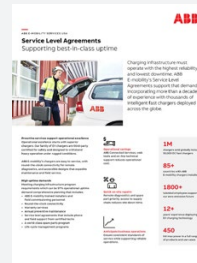


ABB E-mobility facilitates charger reliability through our comprehensive approach to service, including Service Level Agreements (SLAs) that support high uptime requirements.



SUPERIOR CHARGERS

The highest quality and widest range of charging technology

- High quality: components, materials and designs in the widest power range
- Field tested: Built on more than decade of experience in all conditions and use cases
- Safety first: Third party certifications; company-wide health, safety and sustainability mandates.



SMARTEST SERVICES

The most flexible provider of smart, networked and remotely serviced chargers

- Business model enablement, technology integration teams and on-line connectivity
- High uptime: Remote and field service support team for exceptional charger availability
- Future-proof: Always up to date with latest standards and protocols



RELIABLE PARTNER

Vast experience designing and deploying EV charging technology

- Project and service excellence: Dedicated teams to support charger deployment and maintenance
- Human talent: unrivaled engineering and service organization
- Committed: Electrifying transportation for more than a decade

ABB E-mobility has the technology, services and experience to enable successful EV charging programs.

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