

## Table of Contents

|  |             |
|--|-------------|
| <b>Section 5.55. Timing Devices .....</b>  | <b>5-41</b> |
| <b>A. Application .....</b>  | <b>5-41</b> |
| A.1. General.....  | 5-41        |
| A.2. Additional Code Requirements.....   | 5-41        |
| <b>S. Specifications.....</b>  | <b>5-41</b> |
| S.1. Design of Indicating and Recording Elements and of Recorded Representations. ....   | 5-41        |
| S.1.1. Primary Elements.....   | 5-41        |
| S.1.2. Graduations.....  | 5-42        |
| S.1.3. Indicators.....   | 5-42        |
| S.1.4. Recorded Representations.....   | 5-42        |
| S.2. Marking Requirements, Operating Instructions.....   | 5-43        |
| S.3. Interference.....   | 5-43        |
| S.4. Provisions for Sealing.....   | 5-43        |
| S.5. Power Interruption.....   | 5-43        |
| S.5.1. Transaction Termination.....  | 5-43        |
| S.5.2. User Information.....   | 5-43        |
| <b>N. Notes.....</b>   | <b>5-44</b> |
| N.1. Test Method.....  | 5-44        |
| N.2. Broadcast Times and Frequencies.....  | 5-44        |
| N.3. Interference Tests, EVSE.....   | 5-44        |
| <b>T. Tolerances.....</b>  | <b>5-44</b> |
| T.1. Tolerance Values.....   | 5-44        |
| T.1.1. For Timing Devices Other Than Those Specified in T.1.2. For Time Clocks and Time<br>Recorders and T.1.3. On Parking Meters..... | 5-44        |
| T.1.2. For Time Clocks and Time Recorders.....   | 5-45        |
| T.1.3. On Parking Meters and Other Timing Devices Used to Assess Charges for Parking.....  | 5-45        |
| T.2. Tests Involving Digital Indications or Representations.....   | 5-45        |
| <b>UR. User Requirements .....</b>   | <b>5-45</b> |
| UR.1. Statement of Rates.....  | 5-45        |
| UR.2. Time Representations.....  | 5-45        |

THIS PAGE INTENTIONALLY LEFT BLANK

## Section 5.55. Timing Devices

### A. Application

**A.1. General.** – This code applies to devices used to measure time during which services are being dispensed (such as vehicle parking, laundry drying, and car washing). This code also applies to Electric Vehicle Supply Equipment (EVSE) when used to assess charges for time-based services in addition to those charged for electrical energy. (Amended 2015)

**A.2. Additional Code Requirements.** – In addition to the requirements of this code, Timing Devices shall meet the requirements of Section 1.10. General Code.

### S. Specifications

#### S.1. Design of Indicating and Recording Elements and of Recorded Representations.

##### S.1.1. Primary Elements.

**S.1.1.1. General.** – A timing device shall be equipped with a primary indicating element, and may also be equipped with a primary recording element. A timing device incorporated into an Electric Vehicle Supply Equipment system for use in assessing charges for timing separate from charges for electrical energy shall be equipped with the capability to provide a recorded representation of the transaction through a built-in or separate recording element. A readily observable in-service light or other equally effective means that automatically indicates when laundry driers, vacuum cleaners, and car washes are in operation shall be deemed an appropriate primary indicating element.

(Amended 1979 and 2015)

**S.1.1.2. Units.** – A timing device shall indicate and record, if the device is equipped to record, the time in terms of minutes for time intervals of 60 minutes or less and in hours and minutes for time intervals greater than 60 minutes.

**S.1.1.3. Value of Smallest Unit.** – The value of the smallest unit of indicated time and recorded time, if the device is equipped to record, shall not exceed the equivalent of:

- (a) one-half hour on parking meters indicating time in excess of two hours;
- (b) six minutes on parking meters indicating time in excess of one but not greater than two hours; or
- (c) five minutes on all other devices, except those equipped with an in-service light.

(Amended 1975)

**S.1.1.4. Advancement of Indicating and Recording Elements.** – Primary indicating and recording elements shall be susceptible to advancement only during the mechanical operation of the device, except that clocks may be equipped to manually reset the time.

**S.1.1.5. Operation of In-Service Indicator Light.** – For devices equipped with an in-service indicator light, the indicator shall be operative only during the time the device is in operation.

(Amended 2015)

**S.1.1.6. Discontinuous Indicating Parking Meters.** – An indication of the time purchased shall be provided at the time the meter is activated in units of no more than one minute for times less than one hour

and not more than two minutes for times of one hour or more. Convenient means shall be provided to indicate to the purchaser the unexpired time.

(Added 1975) (Amended 1976)

### **S.1.2. Graduations.**

**S.1.2.1. Length.** – Graduations shall be so varied in length that they may be conveniently read.

**S.1.2.2. Width.** – In any series of graduations, the width of a graduation shall in no case be greater than the width of the minimum clear interval between graduations and the width of main graduations shall be not more than 50 % greater than the width of subordinate graduations. Graduations shall in no case be less than 0.2 mm (0.008 in) in width.

**S.1.2.3. Clear Interval Between Graduations.** – The clear interval shall be not less than 0.75 mm (0.03 in). If the graduations are not parallel, the measurement shall be made:

- (a) along the line of relative movement between the graduations at the end of the indicator; or
- (b) if the indicator is continuous, at the point of widest separation of the graduations.

### **S.1.3. Indicators.**

**S.1.3.1. Symmetry.** – The index of an indicator shall be symmetrical with respect to the graduations, at least throughout that portion of its length associated with the graduations.

**S.1.3.2. Length.** – The index of an indicator shall reach to the finest graduations with which it is used, unless the indicator and the graduations are in the same plane, in which case the distance between the end of the indicator and the ends of the graduations, measured along the line of the graduations, shall be not more than 1.0 mm (0.04 in).

**S.1.3.3. Width.** – The width of the index of an indicator in relation to the series of graduations with which it is used shall be not greater than:

- (a) the width of the widest graduation; and
- (b) the width of the minimum clear interval between the graduations.

**S.1.3.4. Parallax.** – Parallax effect shall be reduced to a practicable minimum.

### **S.1.4. Recorded Representations.**

**S.1.4.1. Recorded Representations, Electric Vehicle Supply Equipment (EVSE) Timing Devices.** – A timing device incorporated into an EVSE for use in assessing charges for timing separate from charges for electrical energy shall issue a recorded representation itemizing the charges for these services as defined in Section 3.40. Electric Vehicle Fueling Systems.

(Added 2015)

**S.1.4.1.1. Duplicate Receipts.** – Duplicate receipts are permissible, provided the word “duplicate” or “copy” is included on the receipt.

(Added 2015)

**S.1.4.2. Recorded Representations, All Other Timing Devices.** – A printed ticket issued or stamped by a timing device shall have printed clearly thereon:

- (a) the time and day when the service ends and the time and day when the service begins, except that a self-service money-operated device that clearly displays the time of day need not record the time and day when the service begins; or
- (b) the time interval purchased, and the time and day that the service either begins or ends.

(Added 2015)

(Amended 1983 and 2015)

**S.2. Marking Requirements, Operating Instructions.** – Operating instructions shall be clearly stated on the device.

**S.3. Interference.** – The design of the EVSE shall be such that there will be no interference between the time and electrical energy measurement elements of the system.

(Added 2015)

**S.4. Provisions for Sealing.** – Adequate provisions shall be made to provide security for the timing element.

(Added 2015)

**S.5. Power Interruption.** – In the event of a power loss, the information needed to complete any transaction (i.e., delivery is complete and payment is settled) in progress at the time of the power loss (such as the quantity and unit price, or sales price) shall be determinable through one of the means listed below or the transaction shall be terminated without any charge for the electrical energy transfer to the vehicle:

- (a) at the EVSE;
- (b) at the console, if the console is accessible to the customer;
- (c) via on site Internet access; or
- (d) through toll-free phone access.

For EVSEs in parking areas where vehicles are commonly left for extended periods, the information needed to complete any transaction in progress at the time of the power loss shall be determinable through one of the above means for at least eight hours.

(Added 2015)

**S.5.1. Transaction Termination.** – In the event of a power loss, either:

- (a) the transaction shall terminate at the time of the power loss; or
- (b) the EVSE may continue charging without additional authorization if the EVSE is able to determine it is connected to the same vehicle before and after the supply power outage.

In either case, there must be a clear indication on the receipt provided to the customer of the interruption, including the date and time of the interruption along with other information required under S.1.4.2. Recorded Representations, All Other Timing Devices.

(Added 2015)

**S.5.2. User Information.** – The EVSE memory, or equipment on the network supporting the EVSE, shall retain information on the quantity of time and the sales price totals during a power loss.

(Added 2015)

## N. Notes

**N.1. Test Method.** – A timing device shall be tested with a timepiece with an error of not greater than plus or minus 15 seconds per 24-hour period. In the test of timing devices with a nominal capacity of 1 hour or less, stopwatches with a minimum division of not greater than one-fifth second shall be used. In the test of timing devices with a nominal capacity of more than one hour, the value of the minimum division on the timepiece shall be not greater than one second. Time pieces and stopwatches shall be calibrated with standard time signals as described in National Institute of Standards and Technology Special Publication 432, NIST Time and Frequency Dissemination Services, or any superseding publication.

(Amended 1978)

**N.2. Broadcast Times and Frequencies.** – Time and frequency standards are broadcast by the stations listed in Table N.2. Broadcast Times and Frequencies.

| <b>Table N.2.*</b>                     |   |                                    |  |
|--|---|------------------------------------|--|
| <b>Broadcast Times and Frequencies</b> |   |                                    |  |
| <b>Station</b>                         | <b>Location,<br/>Latitude,<br/>Longitude</b>    | <b>Frequency<br/>(MHz)</b>         | <b>Times of<br/>Transmission<br/>(UTC)</b> |
| WWV                                    | Fort Collins, Colorado<br>40°41' N<br>105°02' W | 2.5<br>5.0<br>10.0<br>15.0<br>20.0 | Continuous                                 |
| WWVH                                   | Kauai, Hawaii<br>21°59' N<br>159°46' W          | 2.5<br>5.0<br>10.0<br>15.0         | Continuous                                 |
| CHU                                    | Ottawa, Canada<br>45°18' N<br>75°45' W          | 3.330<br>7.335<br>14.670<br>14.670 | Continuous                                 |

\*From NIST Special Publication 559, "Time and Frequency Users' Manual," 1990.

(Added 1988)

**N.3. Interference Tests, EVSE.** – On an EVSE equipped with a timing device used to calculate time-based charges in addition to any charges assessed for electrical energy, a test shall be conducted to ensure that there is no interference between time and electrical energy measuring elements.

(Added 2015)

## T. Tolerances

**T.1. Tolerance Values.** – Maintenance and acceptance tolerances for timing devices shall be as follows:

**T.1.1. For Timing Devices Other Than Those Specified in T.1.2. For Time Clocks and Time Recorders and T.1.3. On Parking Meters.** – The maintenance and acceptance tolerances shall be:

- (a) On Overregistration: five seconds for any time interval of one minute or more; and

(Amended 1986)

(b) On Underregistration: six seconds per indicated minute.

(Amended 1975 and 1986)

**T.1.2. For Time Clocks and Time Recorders.** – The maintenance and acceptance tolerances on over-registration and underregistration shall be three seconds per hour, but not to exceed one minute per day.

(Amended 1975)

**T.1.3. On Parking Meters and Other Timing Devices Used to Assess Charges for Parking.** – The maintenance and acceptance tolerances are shown in Table T.1.3. Maintenance and Acceptance Tolerances for Parking Meters and Other Timing Devices Used to Assess Charges For Parking.

(Amended 2015)

| <b>Table T.1.3.<br/>Maintenance and Acceptance Tolerances for Parking Meters and<br/>Other Timing Devices Used to Assess Charges for Parking</b> |                            |  |
|--|----------------------------|--|
| <b>Maintenance and Acceptance Tolerances</b>   |                            |  |
| <b>Nominal Time Capacity</b>   | <b>On Overregistration</b> | <b>On Underregistration</b>                            |
| 30 minutes or less   | No tolerance               | 10 seconds per minute,<br>but not less than 2 minutes  |
| Over 30 minutes to and<br>including 1 hour   | No tolerance               | 5 minutes plus 4 seconds<br>per minute over 30 minutes |
| Over 1 hour  | No tolerance               | 7 minutes plus 2 minutes<br>per hour over 1 hour       |

(Amended 2015)

**T.2. Tests Involving Digital Indications or Representations.** – To the tolerances that would otherwise be applied, there shall be added an amount equal to one-half the minimum value that can be indicated or recorded.

**UR. User Requirements**

**UR.1. Statement of Rates.** – The following information shall be clearly, prominently, and conspicuously displayed:

- (a) the price in terms of money per unit or units of time for the service dispensed; and
- (b) for a timing device other than an EVSE, the number of coins the device will accept and be activated by at one time.

(Amended 1976 and 2015)

**UR.2. Time Representations.** – Any time representation shall be within plus or minus two minutes of the correct time in effect in the area, except on an individual clock used only for “time out”; in addition, the time indication of the “time-out” clock shall be the same as or less than that of the “time-in” clock.

(Amended 1975)

THIS PAGE INTENTIONALL LEFT BLANK