

## STANDARD INFORMATION

**Standard Number:** UL 414  
**Standard Name:** Meter Sockets  
**Standard Edition and Issue Date:** 9<sup>th</sup> Edition Dated January 5, 2016  
**Date of Revision:** June 29, 2018  
**Date of Previous Revision of Standard:** January 5, 2016

## EFFECTIVE DATE OF NEW/REVISED REQUIREMENTS

**Effective Date:** **June 29, 2020**

## IMPACT, OVERVIEW, AND ACTION REQUIRED

**Impact Statement:** A review of all Listing Reports is necessary to determine which products comply with new/revise requirements and which products will require re-evaluation. **NOTE:** Effective immediately, this revised standard will be exclusively used for evaluation of new products unless the Applicant requests in writing that current requirements be used along with their understanding that their listings will be withdrawn on Effective Date noted above, unless the product is found to comply with new/revise requirements.

### Overview of Changes:

- Revision to the Heating Test Conductor Requirement from Aluminum to Copper
- Revision to Address Meter Socket Adapters Provided with Means for Connection to Alternative Energy Systems

Specific details of new/revise requirements are found in table below.

**If the applicable requirements noted in the table are not described in your report(s), these requirements will need to be confirmed as met and added to your report(s) such as markings, instructions, test results, etc. (as required).**

### Client Action:

**Information** – To assist our Engineer with review of your Listing Reports, please submit technical information in response to the new/revise paragraphs noted in the attached or explain why these new/revise requirements do not apply to your product (s).

***Current Listings Not Active? – Please immediately identify any current Listing Reports or products that are no longer active and should be removed from our records. We will do this at no charge as long as Intertek is notified in writing prior to the review of your reports.***



## STANDARD INFORMATION

| CLAUSE  | VERDICT | COMMENT  |
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| <p>Additions to existing requirements are <u>underlined</u> and deletions are shown <del>lined out</del> below.</p> |         |  |
| 14  | Info    | <p><b>Heating Test</b></p> <p><del>Aluminum</del> <u>Copper</u> conductors rated for 75°C (167°F) are to be used for temperature tests. The size is to be chosen from Table 7.1 for 75°C conductors, based on the continuous ampere rating of the meter socket.</p> <p><del>Exception No. 1: Aluminum or copper conductors are not prohibited from being used for a meter socket rated 30 amperes or less.</del></p> <p><del>Exception No. 2: A meter socket rated more than 30 amperes and intended for use only with copper conductors is not prohibited from being tested with copper conductors when it is marked in accordance with 27.10.2.</del></p> <p>Exception No. 1: With reference to footnote b of Table 7.1, conductors sized for 90°C (194°F) ampacity are to be used on the line side of the meter socket when the meter socket is marked for use with 90°C conductors in accordance with 27.10.5. Exception No. 2: To qualify for an ampere rating and marking in accordance with footnote c of Table 7.1, a meter socket is to be tested with conductors of such size that the investigation establishes a continuous ampere rating no less than 80 percent of the note c ratings.</p> |
| Supplement SA   | Info    | <p><b>METER SOCKET ADAPTERS</b></p>  |
| SA3   | Info    | <p><b>General</b></p> <p><i><b>New clause added;</b></i></p>   |
| SA3.2   |         | <p>A meter socket adapter marked in accordance with SA6.2 as being intended for use in a specific meter socket shall be tested in the specific meter socket for which it is marked. No correction factor is necessary.</p>   |
| SA4   | Info    | <p><i><b>Section deleted</b></i></p> <p><i><b>New section added;</b></i></p>   |
| SA4   |         | <p><b>Heating Test</b></p>   |
| SA4.1   |         | <p><b>General</b></p>  |
| SA4.1.1   |         | <p>Meter socket adapters containing a socket intended for installation of a watthour meter shall be subjected to the Heating Test, Section 14, with the additional considerations in SA4.2– SA4.4.</p>   |



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| SA4.2   |         | <b>Meter socket adapters not intended for use in a specific meter socket</b>  |
| SA4.2.1 |         | The meter socket used as a test fixture is to be calibrated before each test. The test fixture is to be calibrated by using a simulated watt-hour meter as described in 14.8 and Figures 14.2 – 14.3. The meter socket is to be rated less than or equal to the continuous current ratings of the meter socket for which the adapter is intended. The test current to determine the correction factor of the adapter is to be equal to the rated current of the meter socket. The simulated meter is to have the same number of current jumper bars as current circuits in the adapter to be tested. A temperature rise is to be determined on the meter socket test fixture by applying the test current to all jumper bars in series until the temperature has stabilized. A temperature correction factor $T_c$ is to be calculated based on the temperature rise at each individual meter socket jaw. The correction factor ( $T_c$ ) equals 65°C (117°F) minus the measured temperature rise at the meter socket jaws. If the measured temperature rise exceeds 65°C, the test is considered inconclusive. |
| SA4.2.2 |         | During subsequent temperature tests on the meter socket adapters, the adapters are to be tested at their rated current. The correction factor ( $T_c$ ) is to be added to the final measured temperatures attained on the meter socket jaw and the busses connected to the meter socket jaw.  |
| SA4.3   |         | <b>Meter socket adapters intended for use only in a specific meter socket</b>   |
| SA4.3.1 |         | Meter socket adapters intended for use only in a specific meter socket shall be subjected to the Heating Test, Section 14, with the meter socket adapter installed in the specific meter socket with which the meter socket adapter is intended to be used.   |
| SA4.3.2 |         | If a meter socket adapter is intended for use with more than one specific meter sockets, the test shall be conducted with each of the specified meter sockets.  |
| SA4.4   |         | <b>Meter socket adapters with provisions for connection of an alternative energy source</b>   |
| SA4.4.1 |         | For meter socket adapters with provisions for connection of an alternative energy source, the test method described in Section 14 shall be modified as described in SA4.4.2 – SA4.4.4.  |
| SA4.4.2 |         | The test described in 14.2 (b) shall be conducted with a total load of 100 percent of the continuous current rating of the meter socket adapter, supplied through the utility source terminals.   |
| SA4.4.3 |         | The test described in 14.2 (e) shall be conducted with a total load of 120 percent of the continuous current rating of the meter socket adapter, supplied through the utility source terminals.   |
|         |         | The test described in 14.2 (f) shall be conducted two times:  |
| SA4.4.4 |         | a) One test shall be conducted with a total load of 100 percent of the continuous current rating of the meter socket adapter. For this test, the alternative energy source terminals shall carry 100 percent of the alternative energy source terminal  |



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|         |         | ratings, and the utility source terminals shall carry sufficient current so the total current supplied by the two sources is no less than the 100 percent of the continuous ampere rating of the meter socket adapter; and<br>b) The second test shall be conducted with a total load of 100 percent of the continuous current rating of the meter socket adapter, supplied through the utility source terminals. |
| SA5     | Info    | <b>Section deleted;</b>   |
| SA5     |         | <b>New section added;</b>   |
|         |         | <b>Short-Circuit Current Test</b>   |
| SA5.1   |         | <b>General</b>  |
| SA5.1.1 |         | A meter socket adapter marked with a short-circuit current rating greater than 10,000 amperes shall be subjected to the Short Circuit Current Test, Section 15, or the Short-Circuit Current Test with Specific Circuit Breaker, Section 16, as appropriate. The test is to be conducted in addition to any short circuit test that may be required by the end-product standard.                                  |
| SA5.2   |         | <b>Meter socket adapters with provisions for connection of an alternative energy source</b>   |
| SA5.2.1 |         | All meter socket adapters with provisions for connection of an alternative energy source having integral overcurrent protection shall be subjected to a short circuit withstand test in accordance with SA5.2.2 – SA5.2.12.   |
| SA5.2.2 |         | The meter socket adapter shall be installed in a meter socket as in a typical installation, and a commercially available watt-hour meter shall be installed in the meter socket adapter.  |
| SA5.2.3 |         | The meter socket enclosure shall be connected to the line lead of the pole least likely to arc to the enclosure. This connection shall be made using a 10 AWG copper wire, 4 to 6 ft (1.2 to 1.8 m) in length, through a 30 ampere, non-delay-type cartridge fuse having a voltage rating no lower than the test voltage.   |
| SA5.2.4 |         | The alternative source terminals of the meter socket adapter are to be connected using copper conductors having an ampacity, based on 75°C insulation, nearest to, but not less than the continuous current rating of the alternate energy connection. The conductors shall have a length of no greater than 4 feet (1.2 m) per terminal.   |
| SA5.2.5 |         | The load terminals of the meter socket are to be connected using copper conductors having an ampacity, based on 75°C insulation, nearest to, but not less than the continuous current rating of the meter socket. The conductors shall have a length of no greater than 4 feet (1.2 m) per terminal.  |
| SA5.2.6 |         | The open-circuit voltage at the supply connections shall be between 100 and 105 percent of rated voltage for the test being conducted. With the concurrence of those concerned, the open-circuit voltage at the supply connection may be higher than 105 percent. The supply frequency shall be in the range of 48 – 60 hertz.  |



| CLAUSE                                     | VERDICT              | COMMENT  |  |                      |            |     |                 |     |                   |     |
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| SA5.2.7                                    |                      | For tests on single phase meter socket adapters, the test circuit shall be controlled so that closing occurs within 10 electrical degrees of the zero point of the supply-voltage wave. Three phase tests are to be conducted using random closing.  |  |                      |            |     |                 |     |                   |     |
| SA5.2.8                                    |                      | The available rms symmetrical current is to be determined at the test station terminals and shall be no less than the short circuit rating of the meter socket adapter.  |  |                      |            |     |                 |     |                   |     |
| SA5.2.9                                    |                      | The power factor of the circuit shall not exceed the values shown in Table SA5.1, based on the short-circuit current rating of the meter socket adapter.   |  |                      |            |     |                 |     |                   |     |
| <b>Power factor</b>                        |                      |  |  |                      |            |     |                 |     |                   |     |
| Table SA5.1                                |                      | <table border="1"> <thead> <tr> <th>Short-circuit current, symmetrical amperes</th> <th>Maximum power factor</th> </tr> </thead> <tbody> <tr> <td>0 - 10,000</td> <td>0.5</td> </tr> <tr> <td>10,001 - 20,000</td> <td>0.3</td> </tr> <tr> <td>20,001 and higher</td> <td>0.2</td> </tr> </tbody> </table>   | Short-circuit current, symmetrical amperes | Maximum power factor | 0 - 10,000 | 0.5 | 10,001 - 20,000 | 0.3 | 20,001 and higher | 0.2 |
| Short-circuit current, symmetrical amperes | Maximum power factor |  |  |                      |            |     |                 |     |                   |     |
| 0 - 10,000                                 | 0.5                  |  |  |                      |            |     |                 |     |                   |     |
| 10,001 - 20,000                            | 0.3                  |  |  |                      |            |     |                 |     |                   |     |
| 20,001 and higher                          | 0.2                  |  |  |                      |            |     |                 |     |                   |     |
| SA5.2.10                                   |                      | For meter socket adapters with a short-circuit current rating above 10,000 amperes, the available peak current of the test circuit shall be no less than 30,000 amperes, unless the peak let-through current for the overcurrent protection in the meter socket adapter is known to be less than 30,000 amperes, in which case the available peak current of the test circuit may be less than 30,000, but shall be no less than the peak let-through current for the overcurrent protection used.   |  |                      |            |     |                 |     |                   |     |
| SA5.2.11                                   |                      | The overcurrent protective device shall be closed prior to applying the short-circuit current to the meter socket adapter. The test current shall be maintained until the overcurrent protective device in the meter socket adapter opens the circuit.   |  |                      |            |     |                 |     |                   |     |
| SA5.2.12                                   |                      | At the conclusion of the test, the meter socket adapter shall be subjected to the Dielectric Withstand Test, Section 20, and shall comply with the criteria in SA5.2.13.   |  |                      |            |     |                 |     |                   |     |
|  |                      | After the test described in SA5.2.1– SA5.2.12:   |  |                      |            |     |                 |     |                   |     |
| SA5.2.13                                   |                      | <ul style="list-style-type: none"> <li>a) There shall be no permanent distortion or displacement of parts that affect the normal functioning of the meter socket or that reduce electrical spacing to less than 85 percent of the required spacing;</li> <li>b) There shall be no breakage or cracking of an insulator or support to such extent that the integrity of the mounting of a live part was impaired;</li> <li>c) The fuse connected to the enclosure shall not open;</li> <li>d) There shall be no damage to the enclosure or parts of the enclosure, or displacement of the meter socket adapter, to the extent that live parts are accessible;</li> <li>e) There shall be no evidence of arcing between live parts of opposite polarity;</li> <li>f) No conductor shall have pulled out of a terminal connector and neither the insulated conductor nor the connector shall be damaged; and</li> <li>g) There shall be no indication of breakdown during the dielectric voltage-withstand test.</li> </ul> |  |                      |            |     |                 |     |                   |     |



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|        |         | CUSTOMERS PLEASE NOTE: This Table and column “Verdict” can be used in determining how your current or future production is or will be in compliance with new/revised requirements. |