

Subject 834

August 3, 2018

## **SUMMARY OF TOPICS**

***The following changes in requirements to the Standard for Heating, Water Supply, and Power Boilers - Electric, UL 834, are being proposed:***

### ***1. Addition of Medium Voltage Requirements***

#### **STP BALLOTS AND ALL COMMENTS DUE: SEPTEMBER 3, 2018**

UL's goal is to have no interest category comprise more than one-third of the STP membership balance. To improve the current balance for STP 834, UL is looking for participants in the AHJ, Commercial/Industrial User, General, Government, Supply Chain, and Testing & Standards interest categories. Definitions for these interest categories are available on the Standards STP Internet site:

<http://ulstandards.ul.com/develop-standards/participation/interest-categories/>

If you are interested in applying for STP 834 membership or are aware of potential candidates for this STP, please contact the STP Project Manager, Marcia.M.Kawate@ul.com.

For your convenience in review, proposed additions to existing requirements are shown underlined and proposed deletions are shown ~~lined-out~~.

### **1. Addition of Medium Voltage Requirements**

#### **RATIONALE**

Proposal submitted by: Mark Skierkiewicz, UL LLC

The current standard limits the voltage of products to 600 volts and below. There has been a need to investigate products that will use a higher voltage. This proposal provides a path to evaluate products under UL 834 with voltages up to 15,000 volts.

#### **PROPOSAL**

1.1 These requirements cover electric heating, water supply, and power boilers rated at ~~600~~ 15,000 volts or less intended for commercial or industrial applications utilizing hot water or steam. They may also be used for commercial, industrial, or residential use space heating applications.

6.13 MEDIUM VOLTAGE – Voltage greater than 600 V, up to and including 15,000 V.

13.8 Boilers rated greater than 600 V shall not be buss bar connected.



**Table 35.1**  
**Minimum acceptable spacings**

| <b>Voltage rating, V</b>                                                                                                                                                                                                                                   | <b>Minimum spacings</b>                      |               |                     |               |                                                                                                                                                                                                                 |                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|---------------|---------------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
|                                                                                                                                                                                                                                                            | <b>Between a live part and the enclosure</b> |               |                     |               | <b>Between uninsulated live parts of opposite polarity; and between a rigidly mounted uninsulated live part and a dead metal part that is exposed to contact by persons or that may be grounded<sup>a</sup></b> |                     |
|                                                                                                                                                                                                                                                            | <b>Through air</b>                           |               | <b>Over surface</b> |               | <b>Through air</b>                                                                                                                                                                                              | <b>Over surface</b> |
|                                                                                                                                                                                                                                                            | <b>inch</b>                                  | <b>(mm)</b>   | <b>inch</b>         | <b>(mm)</b>   | <b>inch</b>                                                                                                                                                                                                     | <b>(mm)</b>         |
| 0 – 250 volts                                                                                                                                                                                                                                              | 1/2                                          | (12.7)        | 1/2                 | (12.7)        | 1/8                                                                                                                                                                                                             | (3.2)               |
| 251 – 600 volts                                                                                                                                                                                                                                            | 1/2                                          | (12.7)        | 1/2                 | (12.7)        | 1/4                                                                                                                                                                                                             | (6.4)               |
| 2500 volts maximum <sup>b</sup>                                                                                                                                                                                                                            | <u>2</u>                                     | <u>(50.8)</u> | <u>3</u>            | <u>(76.2)</u> | <u>1</u>                                                                                                                                                                                                        | <u>(25.4)</u>       |
| 7200 volts maximum <sup>b</sup>                                                                                                                                                                                                                            | <u>3</u>                                     | <u>(76.2)</u> | <u>4</u>            | <u>(102)</u>  | <u>2</u>                                                                                                                                                                                                        | <u>(50.8)</u>       |
| 15000 volts maximum <sup>b</sup>                                                                                                                                                                                                                           | <u>6</u>                                     | <u>(152)</u>  | <u>8</u>            | <u>(203)</u>  | <u>4</u>                                                                                                                                                                                                        | <u>(102)</u>        |
| <sup>a</sup> If an uninsulated live part is not rigidly supported, or if a movable dead metal part is in proximity to an uninsulated live part, the construction is to be such that the minimum spacing will be maintained under all operating conditions. |                                              |               |                     |               |                                                                                                                                                                                                                 |                     |
| <sup>b</sup> <u>Because of the effect of configuration, spacings in excess of those indicated may be required to meet performance requirements of this standard.</u>                                                                                       |                                              |               |                     |               |                                                                                                                                                                                                                 |                     |

**Table 46.1**  
**Dielectric voltage-withstand test conditions**

| <b>Circuit</b>                                               | <b>Test potential, RMS</b>                                                                                                                                                                                                                                      |
|--------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Primary circuit to dead metal parts                          | A. 1000 volts for boilers rated up to 250 volts.<br>B. 1000 volts plus twice rated voltage for boilers rated <u>greater than 250 between 251 and 600</u> volts.<br><u>C. 2000 volts plus 2.25 times rated voltage for boilers rated greater than 600 volts.</u> |
| Primary circuits to secondary circuits of isolation circuits | Same as above                                                                                                                                                                                                                                                   |
| Secondary circuits to dead metal parts                       | 10 times maximum secondary voltage but not less than 500 volts                                                                                                                                                                                                  |

54.2 The alternating-current test potential is to be:

- a) For an appliance rated 250 volts or less, 1200 volts; and
- b) For an appliance rated between 251 and 600 volts ~~more than 250 volts~~, 120 percent of the sum of 1000 volts plus twice the rated voltage; and
- c) For an appliance rated greater than 600 volts, 120 percent of the sum of 2000 volts plus 2.25 times the rated voltage.

The test potential is to be applied for 1 second.

*Exception: The test potential may be reduced to 5/6 (83-1/3 percent) of the specified value if the time of application is increased to 1 minute.*

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