



Errata

NFPA 1801

Standard on Thermal Imagers for the Fire Service

2010 Edition

Reference: Entire Document

Errata No.: 1801-10-1

The Committee on Electronic Safety Equipment notes the following errors in the 2010 edition of NFPA 1801, *Standard on Thermal Imagers for the Fire Service*.

1. In 6.4.4(3) change “Digital temperature measurement” to “Numeric temperature measurement indicator”.

2. Revise 6.6.4.1.2 to read as follows:

6.6.4.1.2 The temperature measurement zone indicator shall ~~be an icon consisting~~ consist of a transparent square box or box corners with a green border as shown in Figure 6.6.4.

3. Revise 6.6.4.1.3 to read as follows:

6.6.4.1.3 The temperature measurement zone ~~icon~~ indicator shall be positioned in the center of the vertical viewing area (alarm and operational indicators) as shown in Figure 6.6.4.

4. Revise 6.6.4.1.4 to read as follows:

6.6.4.1.4 Where the thermal imager is equipped with temperature measurement, the viewing area shall include ~~either~~ a numeric temperature indicator, a temperature bar, or both.

5. Revise 6.6.4.1.5 to read as follows:

6.6.4.1.5 The temperature bar ~~indicator~~ shall be solid green in color. The temperature bar ~~indicator~~ shall be calibrated to show four divided increments. The approximate temperature at each division shall be shown next to the temperature bar as shown in Figure 6.6.3 and Figure 6.6.4. The temperature measurement bar shall be positioned in the right vertical viewing area (temperature sensing indicators) as shown in Figure 6.6.4.

6. Revise 6.6.4.1.7 to read as follows:

6.6.4.1.7 Where the thermal imager is equipped with heat indicating color capability, the right vertical section of the viewing area shall include a heat color reference bar that shall include the heat color reference scale as described in 6.6.4.1.11.

7. Revise 6.6.4.1.8 to read as follows:

6.6.4.1.8 Where equipped with heat indicating color capability, the heat color reference bar shall be located adjacent to the temperature bar, if equipped, and shall permit the user to interpret the approximate temperature reading displayed by the temperature bar ~~indicator~~ as shown in Figure 6.6.4.

6.6.4.1.8.1 Where equipped with both the heat color reference ~~scale bar~~ scale bar and the temperature measurement bar, the heat color reference ~~scale bar~~ scale bar and the temperature measurement bar shall utilize only one set of temperature graduations.

6.6.4.1.8.2 Where equipped with only a heat color reference ~~scale bar~~ scale bar, the heat color reference ~~scale bar~~ scale bar shall have a graduation corresponding to the temperature settings of the thermal imager.

8. Revise 6.6.4.1.9 to read as follows:

6.6.4.1.9 The temperature bar indicator shall be solid green in color. The temperature bar shall be calibrated to show four divided increments. Where a heat color reference ~~scale bar~~ scale bar is provided, the temperature bar ~~indicator~~ shall advance vertically along the heat color reference ~~scale bar~~ scale bar in reference to the approximate temperature of the LWIR energy emitted by an object targeted by the temperature ~~sensing~~ measurement zone.

9. Revise 6.6.4.1.11 to read as follows:

6.6.4.1.11 In the TI BASIC mode, the heat color reference ~~scale bar~~ scale bar shall have a color scale that includes only the following colorization:

- (1) Transparent – at the bottom of the heat color reference ~~scale bar~~ scale bar before color indication begins
- (2) Yellow – at the low end of the heat color reference ~~scale bar~~ scale bar
- (3) Orange – in the middle of the heat color reference ~~scale bar~~ scale bar
- (4) Red – at the high end of the heat color reference ~~scale bar~~ scale bar

10. Revise 6.6.4.7 and 6.6.4.7.3 to read as follows:

6.6.4.7 ~~Temperature Measurement Zone~~ TI BASIC PLUS Operational Format Indicator.

6.6.4.7.3 ~~The temperature measurement zone icon~~ The TI BASIC PLUS operational format indicator shall be positioned in the lower left (additional information area) vertical section of the viewing area as shown in Figure 6.6.4.

11. Revise 6.6.4.8, 6.6.4.8.2, and 6.6.4.8.3 to read as follows:

6.6.4.8 TI BASIC PLUS Options Indicators.

6.6.4.8.2 Each TI BASIC PLUS option ~~icon~~ indicator shall consist of an ~~icon~~ indicator distinctly different from other icons.

6.6.4.8.3 Each TI BASIC PLUS option ~~icon~~ indicator shall be displayed in the center of the left (additional information area) vertical section of the viewing area.

12. In 7.1.3 delete the words “measured in degrees C” and change “indication color” to “indicating color”.

13. Revise 8.1.4.9 to read as follows:

8.1.4.9 The visible spectrum camera shall be a Nikon D3; the lens shall be a Nikkor 28 mm, f/2.8; ~~and~~ the close-up filter shall be +10; and the shutter shall be activated by a remote trigger release. Other lenses and filters of equivalent quality shall be permitted to be used in cases where the thermal imager display size or configuration is incompatible with the use of the Nikkor 28 mm, f/2.8 and the +10 close-up filter. ~~and the shutter shall be activated by a remote trigger release.~~

14. Revise 8.1.5.5 to read as follows:

8.1.5.5 The thermal imager shall be positioned such that the nonuniformity source target fills the entire FOV and the thermal imager's ~~outermost lens is parallel with~~ line of sight is perpendicular to the nonuniformity source target surface.

15. *Revise 8.1.6.2 to read as follows:*

8.1.6.2 The thermal imager shall be activated ~~at least 30 seconds prior to commencing the test. 3 minutes, ± 1 minute,~~ prior to the beginning of the test. Specimens shall operate in the TI BASIC mode.

16. *Delete paragraphs 8.1.6.10, 8.1.6.10.1 and 8.1.6.10.2 and Figure 8.1.6.10.1. Text is repeated in paragraphs 8.1.6.11, 8.1.6.11.1 through 8.1.6.11.2 and Figure 8.1.6.11.1 in the chapter.*

17. *Delete 8.1.6.13*

18. *Revise 8.1.6.17(2) to read as follows, and change numbers following "CTF" in 8.1.6.17 (1 through 9) to subscripts:*

- (1) CTF₁ 0.029 cyc/mrad
- (2) CTF₂ ~~0.038~~ 0.058 cyc/mrad
- (3) CTF₃ 0.083 cyc/mrad
- (4) CTF₄ 0.118 cyc/mrad
- (5) CTF₅ 0.143 cyc/mrad
- (6) CTF₆ 0.167 cyc/mrad
- (7) CTF₇ 0.200 cyc/mrad
- (8) CTF₈ 0.250 cyc/mrad
- (7) CTF₉ 0.286 cyc/mrad

19. *Revise 8.1.6.20 to read as follows:*

8.1.6.20 The image quality probability (P_{IQ}) shall be calculated for the nonuniformity procedure at setpoint temperatures of 1°C, 30°C, 100°C, 160°C, and 260°C (34°F, 86°F, 212°F, 320°F, and 500°F) as specified in Equation 8.1.6.19, where C is the CTF₁ value calculated ~~at index 1~~ in 8.1.6.12, B is the average brightness calculated ~~in 8.1.6.14, from the images taken for calculation of NU(1), NU(30), NU(100), NU(160), and NU(260),~~ SR is the spatial resolution calculated in 8.1.6.18, and NU is the nonuniformity value calculated in 8.1.5.16, for NU(1), NU(30), NU(100), NU(160), and NU(260) respectively.

20. *Revise 8.2.4.3 and 8.2.4.4 to read as follows:*

8.2.4.3 The large compartments shall encase the complete thermal imager that is larger than ~~203.0~~ 5161 mm² (~~0.315~~ 8 in.²).

8.2.4.4 The small compartments shall encase the complete thermal imager that is smaller than ~~203.0~~ 5161 mm² (~~0.315~~ 8 in.²).

21. *Delete 8.4.4.5 and 8.4.4.5.1.*

22. *Revise 8.4.5 to read as follows:*

8.4.5 Report. ~~The image recognition values in the horizontal and vertical directions shall be calculated, recorded, and reported. The thermal imager shall be inspected for function of controls and operating feature. Corrosion shall be recorded and reported.~~

23. *Revise text in 8.10.4.5 to read as follows; (1) through (19) remain unchanged:*

8.10.4.5 The visible spectrum camera shall be a Nikon D3; the lens shall be a Nikkor 28 mm, f/2.8; ~~and the close-up filter shall be +10;~~ and the shutter shall be activated by a remote trigger release. Other lenses and filters of equivalent quality shall be permitted to be used in cases where the thermal imager display size or configuration is incompatible with the use of the Nikkor 28 mm, f/2.8 and the +10 close-up filter ~~and the shutter shall be activated by a remote trigger release.~~ The

Nikon D3 shall be calibrated for color and luminance every 12 months. All Nikon D3 settings, other than those specified below, shall remain set at the factory selections. The specific modifications to the Nikon D3 settings 1 through 19 shall be as follows:

24. *Revise 8.10.5.5 to read as follows:*

8.10.5.5 All surface temperatures in the FOV shall be ~~adjusted to~~ set at the assigned temperatures and shall be allowed to come to steady-state.

25. *In 8.10.6.2 change “color region” to “hot region”.*

26. *Revise the formula in 8.10.6.6 (2) to read as follows:*

If $0 < \text{Luminosity} \leq 0.5$:

27. *Revise the formula in 8.10.6.6b to read as follows:*

$$\text{Color saturation} = \frac{\text{Max}_c - \text{Min}_c}{2 - \text{Max}_c - \text{Min}_c} \quad (8.10.6.6b)$$

28. *Revise 8.10.7.3 to read as follows:*

8.10.7.3 The bar contrast C , shall be calculated for the bar region of interest in each image as specified in Equation 8.10.7.3. ~~The standard deviation, s , shall be calculated as specified in Equation 8.1.5.14a and shall use an equal number of light pixels and dark pixels within the bar region of interest.~~

$$C = \frac{I_{\max} - I_{\min}}{65536} \quad (8.10.7.3)$$

29. *Revise 8.10.7.5 to read as follows and delete equation in 8.10.7.5:*

8.10.7.5 The image quality probability ($P_{IQ,i}$) for each image shall be calculated as specified in Equation ~~8.10.7.5~~ 8.1.6.19. In Equation 8.1.6.19, C shall be the bar contrast calculated for each image in 8.10.7.3; B shall be the average brightness calculated for each image in 8.10.7.4; SR shall be the spatial resolution calculated in 8.1.6.18; and NU shall be the ~~nonuniformity~~ NU(30) calculated in 8.1.5.15.

30. *Delete 8.10.7.6.*

31. *Revise 8.12.4.11 to read as follows:*

8.12.4.11 The visible spectrum camera shall be a Nikon D3, the lens shall be a Nikkor 28 mm, f/2.8, ~~and the close-up filter shall be +10-, and the shutter shall be activated by a remote trigger release.~~ Other lenses and filters of equivalent quality shall be permitted to be used in cases where the thermal imager display size or configuration is incompatible with the use of the Nikkor 28 mm, f/2.8; and the +10 close-up filter ~~and the shutter shall be activated by a remote trigger release.~~ The Nikon D3 shall be calibrated for color and luminance every 12 months. All Nikon D3 settings, other than those specified below, shall remain set at the factory default selections. The specific modifications to the Nikon D3 settings 1 through 19 shall be as follows:

32. *Delete 8.12.4.12. This information is found in 8.12.5.6.*

33. *Renumber existing 8.12.4.12.1 to 8.12.4.11.1, 8.12.4.12.2 to 8.12.4.12, 8.12.4.12.3 to 8.12.4.13, 8.12.4.13 to 8.12.4.1.4, and 8.12.4.14 to 8.12.4.15.*

34. *Revise 8.12.5.8.1 to read as follows:*

8.12.5.8.1 The T_2 source target shall be set at $T_2 = T_{amb} - 5^\circ\text{C}$, and the T_2 source target shall then be increased at a rate of 0.5°C per minute until $T_2 = T_{amb} + 5^\circ\text{C}$. Uncompressed color images at a minimum bit depth of 16 bits shall be captured from the visible spectrum camera at a rate of one image every 3 seconds, ± 0.1 second, while the T_2 temperature is increasing.

35. Revise 8.12.5.13* to read as follows:

8.12.5.13* The mean pixel intensity of each region of interest in each image shall be calculated using Equation 8.1.5.14a~~b~~. The mean pixel intensities shall then be divided by 65536. For each image, the resulting normalized pixel intensities for the T_{2amb} region of interest shall be subtracted from the T_{amb2} region of interest, and the difference shall be plotted with respect to the T_2 source target temperature. A linear trend line shall be fit to the plotted data using a least squares fit method. The slope of the trend line shall be the response slope. The goodness of fit of the data to the trend line shall be the correlation coefficient.

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(Note: Electronic products and pamphlet reprints may have this errata incorporated. For current information about the NFPA Codes and Standards, including this errata, please see www.nfpa.org/codelist)