



## Fulham FireHorse Emergency Ballast Thermal Testing Procedure

This document describes the thermal testing method and procedure for Fulham FireHorse Emergency Ballasts. Warranty will be considered based on the testing method and results following this procedure.

This document applies to the following models:

Model Name	Ambient Rating
FH7-UNV-500L-CEC	0°C TO 55°C (32°F TO 131°F ) OR 20 °C TO 55°C (68°F TO 131°F ) WHEN USED WITH: 1X -40CRT5, 2D38W, 40CRT9, FT40W, F28T5, 40WT8, F39/49/54W T5HO, CFTR42W
FH11-UNV-750L-CEC	0°C TO 55°C (32°F TO 131°F) OR 15°C TO 55°C (59°F TO 131°F) WHEN USED WITH: F96T12HO (110W) x1, F96T12HO(95W) x1, F54T5HO x1, F35T5 x1, CFQ13W x2, CFTR26W x2, CFTR13W x2 or 2D38W x2
FH12-UNV-1400L-CEC	0°C TO 55°C (32°F TO 131°F)

### Testing checklist:

- A total of eight thermocouples will be need for this test.
- Thermocouple junctions should be fused.
- All thermocouples should comply with the requirement specified in ASTM MNL 12 and as listed in the table of the limits of error specified in NIST ITS 90.
- A "Certificate of Conformance" should be accompanied with thermocouples used.
- Temperature scanner with a minimum of 8 channels for thermocouple measurements is recommended. Make sure that thermocouple type selected is compatible with the temperature scanner.

### Thermocouple placement:

- 6 Thermocouples shall be placed inside the luminaire at the locations specified in Figure 1; each being a distance of 2 inches away from the case and no more than 1.5 inches in height (height of the case).
- 2 Thermocouples will be placed 18 inches away from the luminaire at opposite ends to monitor room temperature.

### Test Conditions:

- Luminaire shall be placed in a room with a stable ambient temperature of 25°C (± 5°C) and allowed to operate for a minimum of 4 hrs. under full load conditions. This will allow enough time for temperatures inside the luminaire to increase to the maximum value and stabilize.

### Temperature Measurement:

- Once 4 hours of operation have elapsed, commence recording the temperature measurements observed on the temperature scanner.
- Measurements should be take three times at 15 min intervals, temperature readings should not fluctuate more than (±)1°C. This will prove that temperature readings inside the luminaire have stabilized and are accurate.
- If temperature readings have not stabilized, the luminaire should be left operational until test result meet required criteria above.



Results (Temperature Adjustments):

- If the thermocouple readings did not reach or exceed the maximum allowed ambient temperature of 55°C the following should be done:
  - The thermocouple channel with the highest measured temperature reading shall be subtracted from 55°C (55°C - highest measured temperature = X).
  - The value (*designated X*) shall then be added to the room temperature and this will give you the absolute maximum operating ambient condition of the luminaire **(Room Temperature + X = Maximum Operating Room Temperature)**.
  
- If the thermocouple readings reached or exceed the maximum allowed ambient temperature per Ambient Rating Table, the following should be done:
  - Maximum allowed ambient temperature rating will be subtracted from the thermocouple channel with the highest measured temperature reading (*Example: Highest Measured Temperature - 55°C = X*).
  - The value (*designated X*) shall then be subtracted from the room temperature and this will give you the absolute maximum operating ambient condition of the luminaire **(Room Temperature - X = Maximum Operating Room Temperature)**.

Warranty

- Warranty will be considered void if a subtraction needs to be done for temperature adjustments, unless the OEM and End User(s) can guarantee that room ambient temperatures will be kept at or below limits. All testing data results, along with proof of testing method conformity, should be submitted to Fulham Co., Inc. for approval.

**Figure 1**

