DEPARTMENT OF TRANSPORTATION
ENGINEERING SERVICE CENTER
Transportation Laboratory
5900 Folsom Boulevard
Sacramento, California 95819-4612

METHOD OF TEST FOR MERCURY LAMP MULTIPLE CIRCUIT BALLASTS

CAUTION: Prior to handling test materials, performing equipment setups, and/or conducting this method, testers are required to read **"SAFETY AND HEALTH"** in Section D of this method. It is the responsibility of whoever uses this method to consult and use departmental safety and health practices and determine the applicability of regulatory limitations before any testing is performed. Users of this method do so at their own risk.

A. SCOPE

The object of this test is to determine losses, power factor, regulation, and crest factor on multiple circuit ballasts.

This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety problems associated with its use. It is the responsibility of whomever chooses this standard to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. Those using this standard do so at their own risk.

B. APPARATUS: TYPICAL

1. YEW Yokogawa Digital Power Factor Meter, Model 2524.
2. Magtrol Power Analyzer, Model 4612.
3. Tektronix Oscilloscope Model, 2465.
4. Fluke Digital Multimeter, Models 8050A and 8060A.
5. Two Powerstat Variable Autotransformers, 10 Amp.
6. Lamp socket housed in a suitable shield
7. Lamps of various wattages depending upon ballast characteristics

C. TEST PROCEDURE

Connect the ballast to the meters as shown in Figure No. 1. Estimate the approximate current, power, and voltage through the input and output of the ballast and set the meters to the appropriate scales. Use a current transformer to "step-down" the current into an ammeter or wattmeter whenever its ratings would normally be exceeded. Connect the proper load reference lamp and apply the specified input voltage. Measure the peak current with the waveform on the oscilloscope which is calibrated to 2.0 amps (peak) per graticule. After ample warm-up time, record all meter values and the oscilloscope measurement on a data sheet (See Figure 2). Vary the input voltage ± 10% and record the output power for each case on a data sheet (See Figure 3).

The calculation are as follows:

1. Crest Factor = (Peak Current From Oscilloscope) / (R. M. S. Current From Output Ammeter (Model 4612) = I_p/I_{RMS}

2. Regulation:
   Variation = [(Deviated Power Out –Normal Power Out) / (Normal Power Out)] X 100 %

   $V = [(W_d - W_o) / W_o] \times 100\ \%$

3. Losses = [(Power In – Power Out) / Power Out] X 100 %

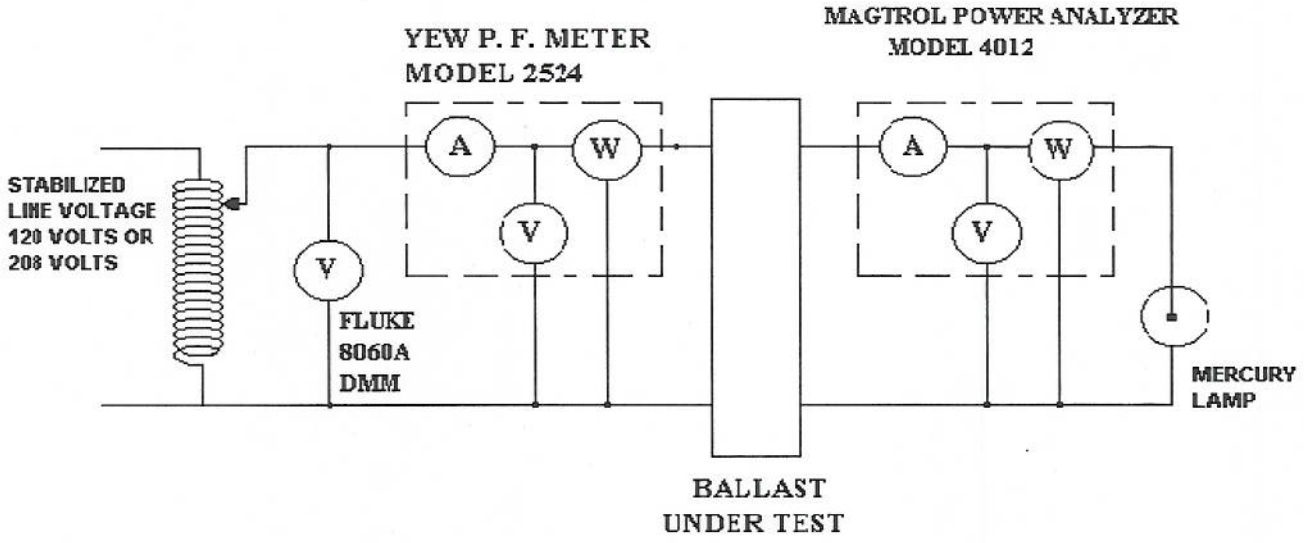
   $L = [(W_i - W_o) / W_o] \times 100\ \%$

D. SAFETY AND HEALTH

Prior to handling, testing or disposing of any waste materials, testers are required to read: Part A (Section 5.0), Part B (Sections: 5.0, 6.0 and 10.0) and Part C (Section 1.0) of Caltrans' Laboratory Safety Manual.

Users of this method do so at their own risk.

End of Test (California Test 679 contains 4 pages)



SIMPLIFIED BALLAST TEST SET-UP

FIGURE 1.