

COOPER HEWITT

HOT
CATHODE
NEON
LAMPS

FOR USE ON ALTERNATING CURRENT

BULLETIN 700

GENERAL  ELECTRIC
VAPOR LAMP COMPANY

HOBOKEN, NEW JERSEY

COOPER HEWITT HOT CATHODE NEON LAMPS

FOR USE ON ALTERNATING CURRENT
OF 60-50 CYCLES

THE COOPER HEWITT Hot Cathode Neon Arc lamp is a compact unit delivering a high intensity of neon light. The light giving element of the unit is a 1" glass tube having an 18" long light source and a maximum overall length of 28". This tube is the most compact source of neon light now available for use on commercial voltages, delivering approximately fifty beam candle power per inch of tube.

The complete lamp unit consists of the light giving tube, an auxiliary device and an enameled steel reflector. The entire unit can be operated directly from 110 volt or 220 volt Alternating Current source and does not necessitate the use of high voltages. The overall power factor of the unit is 90%.

The light giving tube can be used mounted in the reflector supplied or can be operated out of the reflector and in any particular holding device suitable to special installations. The tube can be operated in any position and may, under proper circumstances, be isolated from the auxiliary unit up to distances of approximately 20 feet.

The light from the Cooper Hewitt Hot Cathode Neon lamp is of the characteristic neon spectrum and comprises a multiplicity of lines covering the red and orange portion of the spectrum. There is practically no light

output beyond the orange portion of the visible spectrum. For this reason the lamp is the most efficient source of red and orange light available.

The electrical characteristics and lumen outputs of the Cooper Hewitt Hot Cathode Neon Arc is indicated in Table 1. This lamp has found application in a large number of installations where either large volume or high intensities of red and orange-red light are desirable. The lamp is particularly adapted for special markers, beacons, etc., at ferry slips, aviation fields, building markers, etc.

The pleasing color of the neon spectrum with this lamp as a source has resulted in many applications such as the lighting of feature towers, flood lighting, beacons and architectural relief lighting.

In combination with mercury light, many unusual lighting arrangements have been worked out. These have found application in such places as show windows, sales rooms and for special lighting effects. The neon lamp is adapted to signs where the color, visibility and efficiency have been of material advantage.

Many special lighting units have been manufactured in which the neon tube has been the light source. This covers such things as special lanterns, aviation beacons, obstacle lights

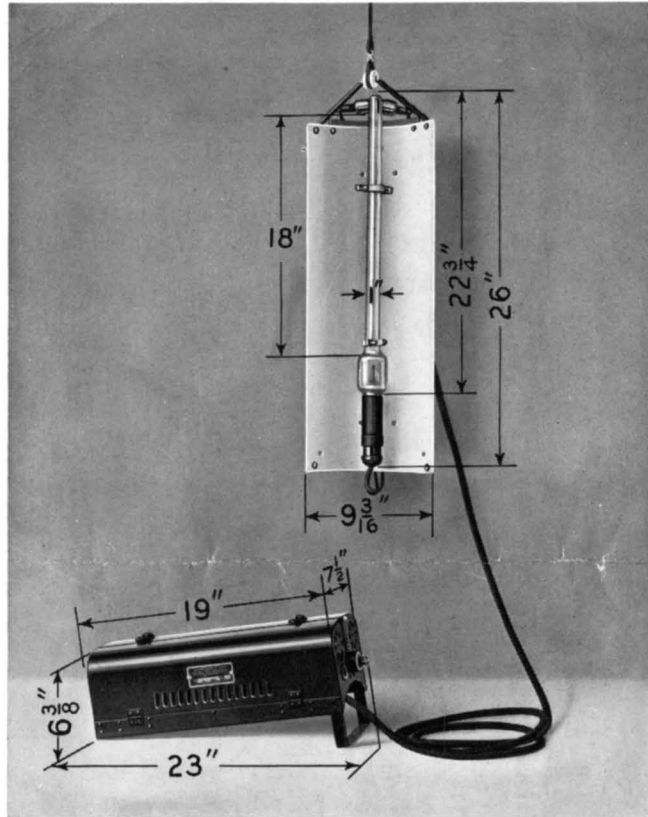


Fig 1—Showing Offset Model of Cooper Hewitt Hot Cathode Neon Lamp

and markers for radio masts, transmission towers, etc. Due to the distinctive color and high transmission of this light, single bare tubes at proper elevation are visible to distances in excess of 30 miles without the use of lenses or reflecting equipment.

The lamp complete operates on the rectifying principle using the hot cathode as the negative terminal of the circuit. This introduces one limiting feature in the wiring of these lamps. The hot cathode heater operates on a 6 volt 9 ampere circuit which is furnished from the auxiliary. This requires that the wire from the auxiliary to the tube be of such capacity as to permit the heating supply without voltage drop.

The starting of the lamp is automatic and

controlled by a thermo-couple which delays the starting of the arc until the cathode has reached the proper operating temperature. This means that there is a delay of approximately 60 seconds between the time of turning on the current and the actual lighting of the lamp tube.

The general form of the lamp and its auxiliary equipment are indicated in Fig. 1. The lamp is regularly supplied in two styles. In one case the suspension type in which the reflector is mounted directly on the underside of the auxiliary. In the offset style the reflector and tube are separated from the auxiliary and connected only by a four wire extension cable which is part of the offset lamp equipment. In special applications where the tube is separated from the reflector and auxiliary, wiring

must be arranged by the user, keeping in mind the following limitations.

When the lamp is not more than 6 feet from the auxiliary, the heater circuit should be wired with nothing smaller than No. 14 wire. No. 12 wire may be used up to distances of 12 feet, No. 10 wire up to distances of 20 feet and No. 8 wire up to distances of 30 feet.

Supply wires coming to the auxiliary should be no smaller than No. 12 wire on 110 volt lamps and No. 14 wire on 220 volt lamps. Circuits should be fused for 15 amperes for single lamps, adding 10 amperes for each additional lamp placed on the circuit in the case of 110 volt lamps. For 220 volt lamps, single lamps should be fused for 10 amperes with additional fusing of 5 amperes for each additional lamp.

ESSENTIAL DATA COOPER HEWITT HOT CATHODE NEON LAMPS

Average Ratings	110-Volt Class	220-Volt Class
Watts	500	500
*Voltage Tap Centers	{ 100 110 120	200 220 240
Power Factor	90%	90%
Mean Hemispherical Candlepower	570	570
Watts per Mean Hemispherical Candlepower	0.875	0.875
Downward Lumens (Lamp Horizontal)	3500	3500
Downward Lumens per Watt	7.16	7.16
Total Lumen Bare Lamp	4950	4950
Per Cent Total Lumens with Reflector	73.6	73.6
Maximum Beam Candlepower with Reflector	975	975

*Lamp should be operated only on voltages which do not vary more than plus and minus 5% from voltage design centers listed above.

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