



Neon Application and Design Factors

Neon Lamp Construction and Operation

Basic Neon Lamp construction is shown below in Figure #1. It consists of the glass tube sealed at the top, thus forming the "Pip." Gas is inserted into the bulb as the seal is formed. This gas surrounds the electrodes. When proper voltage is applied to the lamp, the electrodes ionize the surrounding gas creating a plasma field. This plasma field glows, emitting visible orange light.

Based Neon Lamp Construction

Neon lamps are available in a wide variety of based configurations. As shown in Figure #2, these wire terminal neon lamps are incorporated into the base of your choice and enclosed (in some cases) by a plastic, fluted lens cap. A resistor can be attached internally in order to operate directly on line voltage (120V). Brightness level can also be increased by using a lower value resistor.

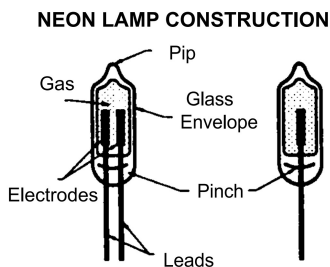


FIGURE 1

BASED NEON LAMP CONSTRUCTION

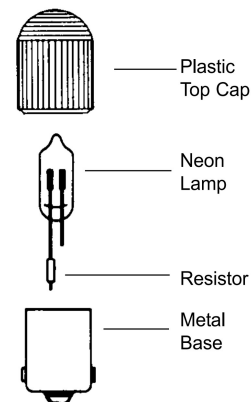
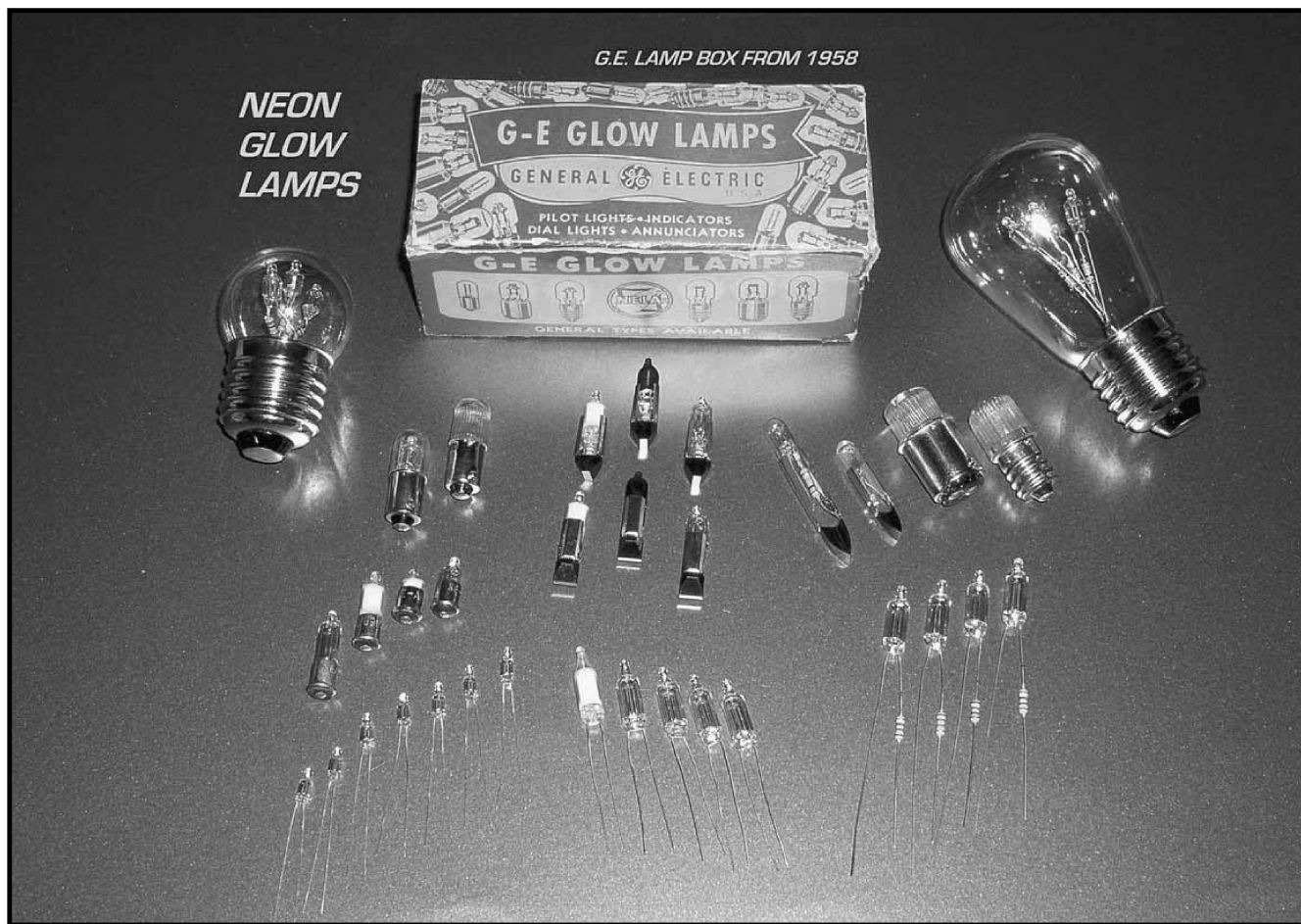


FIGURE 2





Neon Application and Design Factors

Life Expectancy of Neon Lamps

Life expectancy for neons depends on a variety of electrical and operational factors. These factors include supply voltage, resistance value and current. In general, the lower the resistance used, the lower the life hours expected and brightness increases. Conversely, increasing resistance will increase life but reduce brightness. Figure #3 shows the relationship between resistance, brightness level and life expectancy at 120.0V A.C.

Brightness Level	Resistance Value	Life Expectancy
HIGH	10K-20K	10,000 HOURS
STANDARD	35K - 47K	25,000 HOURS
LOW	100K	30,000 HOURS

FIGURE 3

Above life hours are an approximation only. Actual life hours may vary depending upon operating current and brightness maintenance required. See "Lamp Darkening" in the following column for explanation of useful life expectancy for neon lamps.

Custom Neon Lamp Assemblies

Norman can supply custom neon lamp assemblies per your specifications. Attached resistors, special lead lengths, insulated wire leads with terminals and neon arrays are just a few of the options we can supply. Contact us for great pricing.

Neon Lamp Darkening

Neon lamps do not fail abruptly at the end of their life. Instead, their light output gradually decreases due to deposits building up on the interior lamp walls. Light output decreases to an unacceptable level thus ending the neon lamp's useful life. Life expectancies listed in Figure #3 are given at 50% reduction of initial light output.

Neon Lamp Terms and Definitions

Striking Voltage

The voltage at which the neon lamp ignites is usually between 45 and 65V A.C. for standard brightness types and between 70 and 95V A.C. for high brightness types. This is sometimes call the breakdown or ignition voltage.

Maintaining Voltage

The voltage across the lamp after it has ignited. This voltage is a function of the lamp current and is usually quoted at the design current. Nominal values are 60V for standard brightness and 75V for high brightness lamps.

Extinction Voltage

The voltage at which the lamp extinguishes if the supply voltage is reduced. It is normally a few volts below the maintaining voltage.

Design Current

The current at which the lamp has been designed to operate. It will be determined by the supply voltage and the value of series resistance. Operation at lower currents can result in the glow discharge becoming unstable (i.e., flickering) and operation at higher currents can severely reduce the useful life of the lamp. It is therefore important to use only the recommended value of series resistance.

Green and Blue Emitting Neon Lamps

Any neon lamp shown in this catalog can be made to emit a green or blue color glow. In some configurations they are in stock. Call for information regarding these "fluorescent" neon lamps.

Note: Decreasing resistance to neon lamp will result in a shorter service life. See "Life Expectancy of Neons" on the following page. All neon lamps can be supplied with or without a resistor. Call for more information.



Miniature Lamps

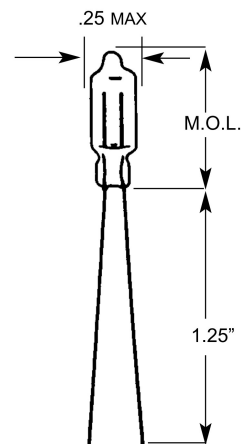
Incandescence • Neon • European

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MINIATURE NEON LAMPS

*Recommended Resistance

CUSTOM LEAD LENGTHS ARE AVAILABLE ON SPECIAL ORDER.
SOLDER-READY TERMINALS



LINE NO.	IGNITION VOLTAGE		DESIGN CURRENT MA	*SERIES RESISTOR 100-125V		220-250V		AVERAGE USEFUL LIFE	BRIGHTNESS LEVEL	COLOR GLOW	M.O.L.	WIRE TERMINAL
	AC	DC		OHMS	W	OHMS	W					
1	65	90	0.6	150K	1/4	540K	1/3	25,000	STANDARD	ORANGE	1.00"	A1A (NE-2)
2	65	90	0.3	220K	1/4	540K	1/3	25,000	STANDARD	ORANGE	.50"	A1B
3	95	135	1.2	47K	1/4	150K	1/3	25,000	HIGH	ORANGE	.50"	A1C
4												
5	65	90	0.7	100K	1/4	220K	1/3	25,000	STANDARD	ORANGE	.84"	A2A (NE-2A)
6	65	90	0.7	100K	1/4	220K	1/3	25,000	STANDARD	ORANGE	.75"	A2B (NE-2V)
7	95	135	1.9	30K	1/4	100K	1/3	25,000	HIGH	ORANGE	.75"	A3C (NE-2U)
8	95	135	1.4	100K	1/4	220K	1/3	25,000	HIGH	ORANGE	.84"	A5A
9												
10	95	135	1.2	68K	1/4	220K	1/3	25,000	STANDARD	ORANGE	1.00"	A6A
11	95	135	1.2	100K	1/4	220K	1/3	25,000	STANDARD	ORANGE	.75"	A7A
12	65	90	0.7	100K	1/4	220K	1/3	25,000	STANDARD	ORANGE	.75"	A9A (NE-2E)
13												
14	95	135	1.9	30K	1/4	100K	1/3	25,000	HIGH	ORANGE	.75"	C2A (NE-2H)
15	95	135	1.5	30K	1/4	100K	1/3	25,000	HIGH	ORANGE	.75"	C3A
16	95	135	1.5	30K	1/4	100K	1/3	25,000	HIGH	ORANGE	.84"	C4A
17	95	135	1.5	30K	1/4	100K	1/3	25,000	HIGH	ORANGE	.84"	C5A
18	95	135	1.5	22K	1/4	100K	1/3	25,000	HIGH	ORANGE	1.00"	C6A
19												
20	95	135	1.2	47K	1/4	150K	1/3	15,000	HIGH	GREEN	.50"	G2B
21	95	135	1.4	35K	1/4	150K	1/3	15,000	HIGH	BLUE	.50"	B2B