

Red

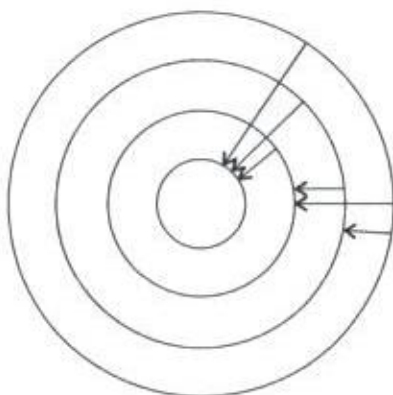
7150

**Spectrum Tube**  
**Ne**

Instruction Manual

## GENERAL SPECIFICATIONS:

Spectrum Tubes contain one or more elements as gaseous atoms or molecules. Energy is supplied through an electric field applied between electrodes at the ends of the tubes. Ions and electrons formed by the field are accelerated; collisions convert the increased Kinetic energy to other types, one being electronic. Electrons in energetic or excited atoms occupy one of many well-defined states. An electron with high energy  $E_3$  will return to a lower energy state  $E_2$ , simultaneously emitting a photon of energy  $E_3 - E_2 = \Delta E = hc/\lambda$ ; where  $h = 6.63 \times 10^{-34}$  J-s is Planck's constant,  $c = 3 \times 10^8$  m/s is the speed of light and  $\lambda$  is the wavelength of light (in meters) in the emitted photon.



light and  $\lambda$  is the wavelength of light (in

Each excited atom type emits characteristic wavelength determined by energy level differences  $\Delta E$  present in that species. One may observe a particular color with the eye; analysis with a spectrometer will reveal a series of sharp (monochromatic) emission lines.

## OBSERVING THE SPECTRA:

These Spectrum Tubes use research-grade gasses and vapors to provide bright-line spectral lines of the highest clarity. They are designed for optimum intensity and line resolution when examined in a student grade spectrometer equipped with a ca.200 line/mm (5000 line/inch) diffraction grating.

The pressure of the various gasses in spectrum tubes is a carefully controlled value that will produce the maximum quality of brightness and clarity of the spectral lines.

For some tubes it is not necessarily the same value of pressure that produces maximum continuous operating life of the spectral lines. Tubes should be energized with the Spectrum Tube Power Supply, which is made expressly for this purpose. Tube life is extended if operation is cyclic for no more than 30 seconds "on", 30 seconds "off" etc.,

Increasing the usable life of the tubes.

Some tubes using neon, helium and other gases found in cold cathode display signs can continuously with less deterioration of the quality of the spectral lines. The others, such as hydrogen, the halogens and water vapor, require more care in processing to increase the life. Pure nickel electrodes and the best research grade of gases are used, and meticulous care is taken in processing to increase service life.

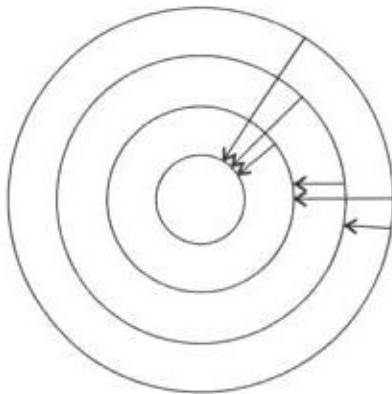
## DESCRIPTION OF SPECTRA:

Strong spectrum of multiple lines in green, yellow, orange, red. Note absence of violet lines. Used in "neon light".

Color	Wavelength Å
Blue	4750
Blue	4900
Green	5100
Green	5250
Green	5600
Green	5700
Yellow	5800
Yellow	5900
Yellow	6000
Red	6050
Red	6100
Red	6150
Red	6200
Red	6600
Red	6650
Red	6700
Red	6850
Red	7050

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