This information is available on the Internet at www.hansen-neon.de or www.klinger-neon.de N20E/02/2003
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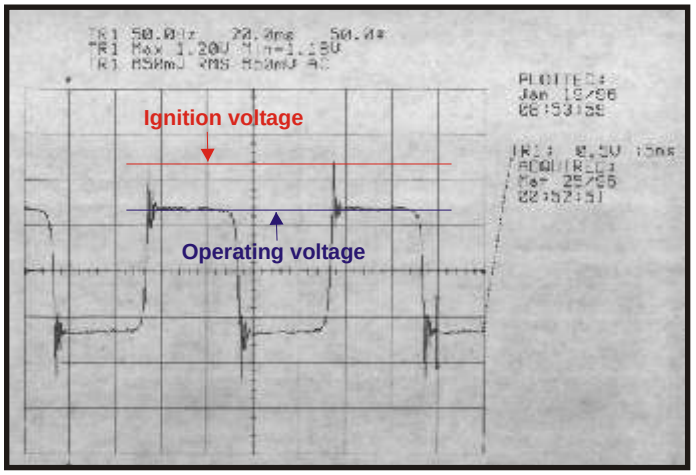
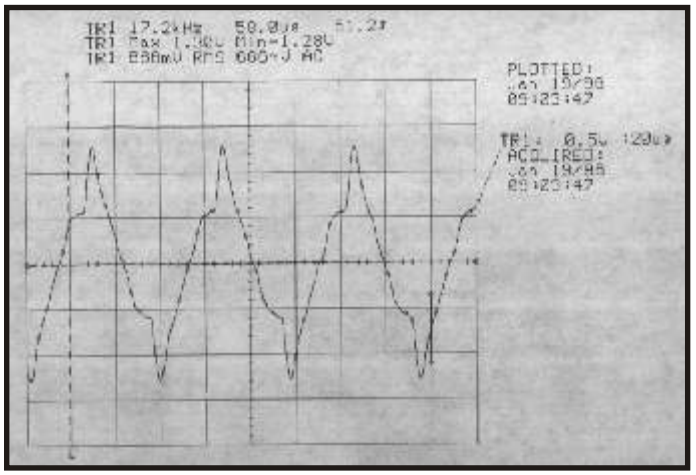
Tube voltage



Tube voltage with a coil & core transformer (50Hz)

Tube load: 1710 mm, 18 mm in diameter
(blue discharge)
Constant-current transformer 40 mA, 990 Volt



Tube voltage using an electronic convertor (20 kHz)

Tube load: 1710 mm, 18mm in diameter
(blue discharge)
Electronic convertor 40 mA, 990 Volt

Before they can light, neon tubes require an electric voltage. If this voltage is sufficiently high the tube is ignited, a current can flow and the neon glows.
In this context, we distinguish between:

Ignition voltage: The voltage level which must be reached for the tube to be ignited so that a current can flow.

Operating voltage: The voltage level which is achieved when a constant current flows after the tube has been ignited.

The behaviour exhibited by traditional coil & core transformers (50 Hz) is different to that of electronic convertors (20,000 Hz):

With traditional coil & core transformers, the fluorescent tube is ignited as soon as the *ignition voltage* is reached. After that, the voltage drops down to the level of the *operating voltage*. If the phase of the mains ac voltage reaches zero, the voltage at the tube is not sufficient any more for the tube to light so that the tube has to be ignited again at the following rise. This can result in a visible flickering of the light.

If a neon tube is operated with an electronic convertor an *ignition voltage* is also required in order to obtain a current flowing through the tube. The voltage also drops down to the *operating voltage level*. But due to the high operating frequency of the electronic convertor (20,000 Hz), the discharging distance of the gas remains *permanently excited* and thus does not have to be ignited again after each zero crossing of the supply voltage. The result is absolutely flicker-free light.