Secondary Wiring Methods

1) Conventional Series Wiring:
This is recommended when the high voltage secondary GTO leads are kept as short as possible. GTO leads should not exceed 10 feet each in metalic conduit. When a 12,000v or 15,000v transformer is used on single stroke border tubing, the transformers can power up to 72' of 15mm mercury. This design would require an excess of 36 feet of GTO in conduit per side if series wired. If a 9000v unit were used there would be a need for 20' per side. The majority of breakdowns in a neon circuit occur on overly- long GTO runs. The use for this wiring method with larger transformers is for double stroke tubing, text, or neon graphics. In these cases the high voltage GTO leads should be of shorter length.

2) Mid-Point Grounded Wiring: (NOT RECOMMENDED WITH SCGFP UNITS)
In this method; the high voltage GTO leads are short. The long lead closing the circuit, under proper loading conditions, should be at or around ground potential. When a mid-point, balanced design transformer is mid-point ground wired, the transformer is electrically partitioned into two transformers. Then, it is important to load the transformer accordingly. e.g. a 12,000V / 30mA can power 45 feet of 15mm neon; comparatively two 6000 / 30's can only power 38 feet. It is important to balance the secondary load as evenly as possible. This method is not recommended for Ground Fault Protected transformers.

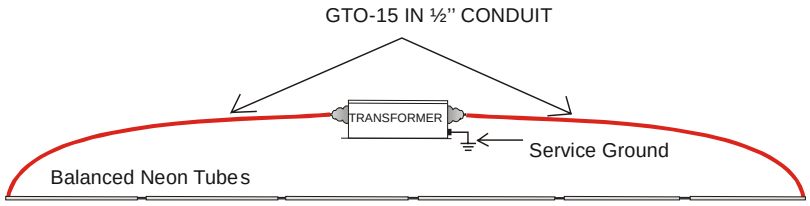
3) Virtual Ground Wiring: (PREFERRED METHOD)
This preferred wiring method is similar to the mid-point ground method above. The difference is that the closing loop does not tie back to ground. This takes advantage of the benefits of the mid-point ground method when using Secondary Ground Fault Protected transformers. However, if the transformer is NOT loaded or balanced properly there is a possibility of elevating the voltage on the return loop and increasing leakage to ground. Thus, it is still very important to balance the neon load evenly.

4) Conversion to Virtual Mid-Point Wiring from Mid Point Ground Wiring
When retrofitting a sign that uses the mid-point ground wiring method, with a secondary ground fault protected transformer, follow the procedure depicted in the diagram to convert the wiring to virtual midpoint ground. The return GTO conductors are to be removed from the ground at the transformer and connected together in a high voltage junction box, well insulated from ground. ***The total length of the two return GTO conductors cannot exceed 40 feet.*** If it does the excess must be cut off. If 40 feet are not long enough to interconnect the end points of the tubing, we recommend splitting the load and using smaller transformers.
Ensure that the two sections of neon tubing at either side of the virtual ground loop are balanced.

Secondary Wiring Diagrams

TRANSFORMER MUST BE GROUNDED

1

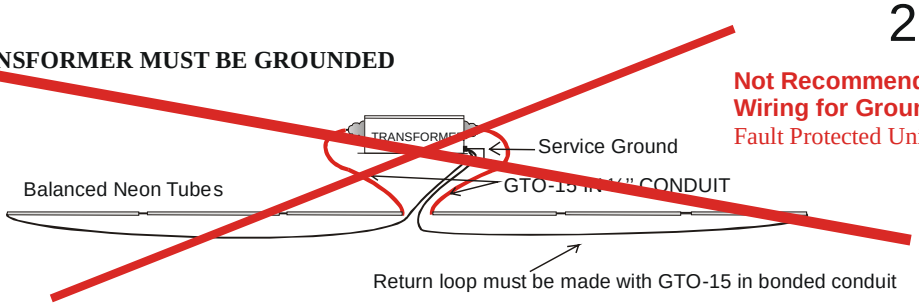


Conventional Series Wiring

2

TRANSFORMER MUST BE GROUNDED

Not Recommended Wiring for Ground Fault Protected Unit

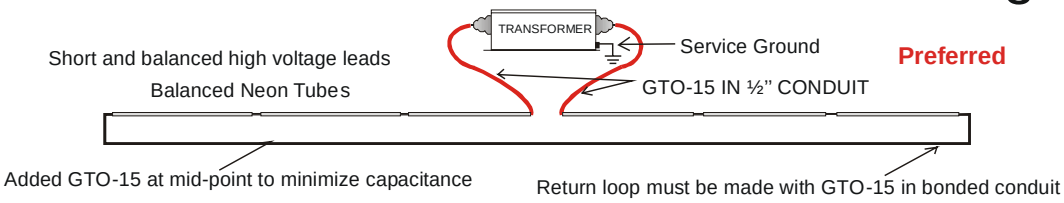


Mid-Point Ground Wiring

TRANSFORMER MUST BE GROUNDED

3

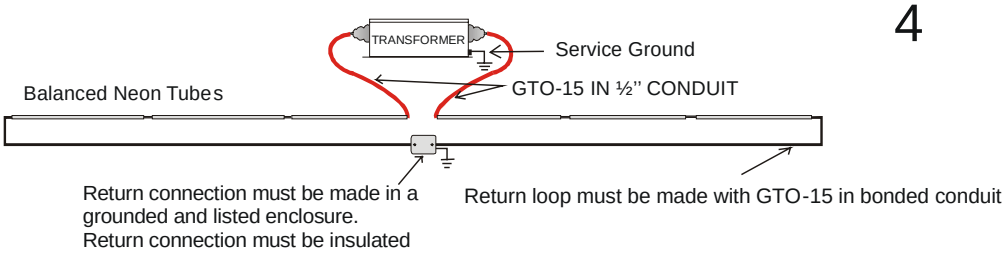
Preferred



Virtual Mid-Point Wiring

TRANSFORMER MUST BE GROUNDED

4



Conversion to Virtual Mid-Point Wiring from Mid-Point Ground Wiring