Cathode Systems of America LLC

Installation Instructions

60ma and 120ma Transformer Systems,
France™ 150ma and 200ma Ballast Systems and
E~Tech™ 120ma and 240ma Ballast Systems
using European Double Back Electrodes

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Installation Instructions

60ma and 120ma Transformer Systems using
Lamps with European Double Back Electrodes

Follow these instructions for the installation of this type of cold cathode lighting system. (Over 1000V normal or high power factor transformers). This Cold Cathode Transformer is Outdoor Type 4 Non-Weatherproof.

Installation of the Transformer

- Follow these instructions for the installation of this type of cold cathode lighting system. (Over 1000V normal or high power factor transformers)

A. Transformer Location

- Mount transformer as close as possible to the center of the run of lamps.
- Ambient temperature shall not exceed 100 F.
- Transformer must be installed in a readily accessible space, not exceeding twenty (20) feet if using metallic conduit or fifty (50) feet if using non-metallic conduit to run GTO high voltage lines.

B. Transformer Mounting

- Mount transformer to a metal stud or other solid structure capable of supporting its weight (approximately 40 pounds).
- Attach transformer with a minimum of two (2), preferably four (4) bolts or screws. Each bolt or screw must be capable of supporting the entire weight of the transformer.

C. Wiring the Primary Circuit of the Transformer

- The primary side of the transformers are 120V or 277V running at 60Hz, and must be powered by a dedicated and grounded circuit.
- Take out screws and remove transformer cover.
- Select and remove conduit knockouts to primary and secondary wiring compartments. Connect 120V or 277V conduit to primary wiring compartment. Metallic or non-metallic conduit operated at 100Hz or less, shall be spaced at least 1 ½" from grounded or bonded parts.
- Using the primary service wire, connect the line and neutral service wires to the corresponding wires within the transformer primary wiring compartment.
- Connect the service ground wire to the service ground lug.
- Note: Only normal power factor transformers are dimmable.

D. Wiring the Secondary Side of the Transformer

- Use only stranded GTO high voltage wire rate at 10,000V or 15,000V as specified.
- Run each GTO high voltage wire through its own conduit into the secondary wiring compartment. Strip wire and connect each high voltage wire to a secondary high voltage lug. Securely tighten the Bakelite knobs to 15 ft. pounds.
- Avoid any sharp bends in the conduit.
- Install UL listed conduit clamps six (6) inches from the GTO high voltage wire to electrode connection and every four (4) feet thereafter.
- Replace transformer cover with screws.

Installation instructions (continued)

E. Virtual Mid-Point Ground Connection

- Run secondary lines from transformer to middle of glass run. (Example: On a system comprised of six, seven foot lamps the high voltage wires from the transformer wires would be attached to the inner electrodes of the two middle lamps.)
- GTO high voltage wire connections are then made from electrode to electrode in series for each side of the glass run.
- The high voltage wire to electrode connection consists of a minimum of five (5) wire wraps.
- A separate GTO high voltage wire is run through metallic or non-metallic conduit to the far ends of the run to complete virtual mid- point ground.
- Secure a UL listed Tecnolux silicon electrode boot in place to cover all high voltage wire to electrode connections.

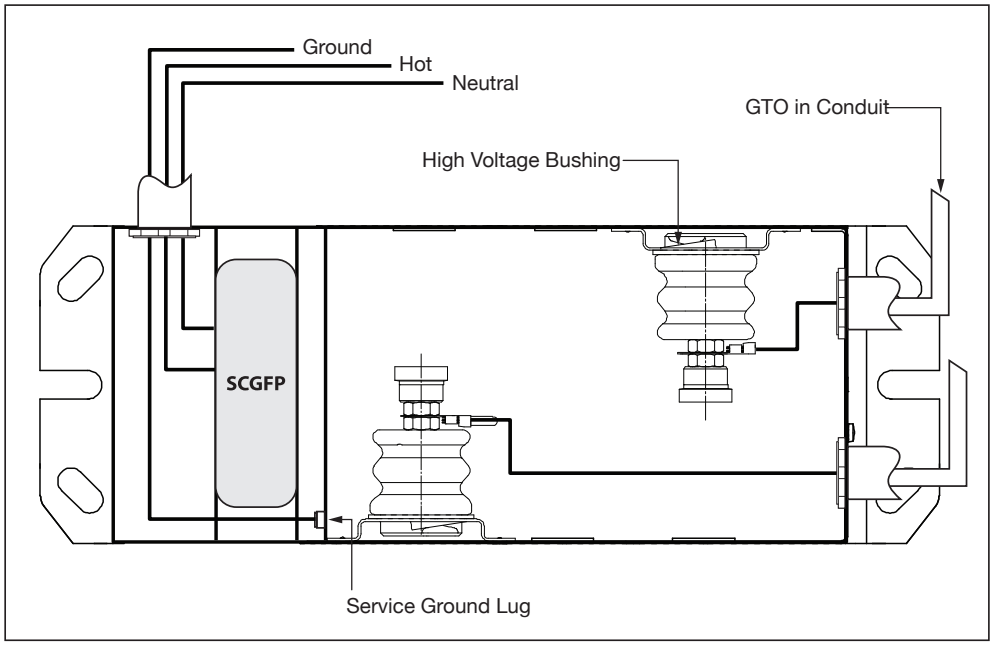
F. Tube Supports

- Tube supports are used to secure the cold cathode lamp in position.
- For straight lamps, a minimum of two supports are required, one support 9" from each end.
- For curved lamps, three supports per lamp are required, one support 9" from each end and one support on center of the lamp.

G. Lamp Spacing

- Lamp ends should be spaced approximately ¼" apart.
- Care must be taken so that lamps do not hit, end to end on installation. This may cause one or both lamps to break.

*** Installation must be in total compliance with the National Electric Code, Underwriters Laboratory and all applicable local codes.



Secondary Ground Fault Transformer Wiring Schematic

Installation Instructions

France™ 150ma and 200ma Ballast Systems using Lamps with European Double Back Electrodes

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Follow these instructions for the installation of this type of cold cathode lighting system. (Under 1000V normal or high power factor ballasts)

Installation of the Ballast

A. Ballast Location

- Mount ballasts as close as possible to the center of the lamp (in one lamp applications) or the center electrodes (in two lamp applications).
- Ambient temperature must not exceed 100 F.
- Ballast must be installed in a readily accessible space, not exceeding 75' from electrode connections, if run in non-metallic conduit.

B. Ballast Mounting

- Mount ballast to a metal stud or other solid structure capable of supporting its weight (approximately 25 pounds).
- Attach ballast with a minimum of two (2), preferably four (4) bolts or screws. Each bolt or screw must be capable of supporting the entire weight of the ballast.

C. Wiring the Primary Circuit of the Ballast

- The primary side of the ballasts are 120V or 277V running at 60 Hz, and must be powered by a dedicated and grounded circuit.
- Remove primary and secondary compartment covers and appropriate knockouts.
- Install primary conduit to primary wiring compartment.
- Using the primary service wire, connect the line and neutral service wires to the corresponding wires within the ballast primary wiring compartment with correctly sized wire nuts.
- Make sure that the ground feed wire is connected to the ballast ground wire with the correctly sized wire nut.
- Note: Only normal power factor ballasts are dimmable.

D. One Lamp Normal Power Factor Ballast Secondary Wiring

- Use UL listed #16 stranded or solid copper wire rated at 1000V.
- Wire nut an additional neutral feed to the primary neutral wire inside the primary wiring compartment of the ballast. Run this wire through UL listed conduit to one end of the lamp.
- Cap off the red wire within the secondary wiring compartment. The blue lead is then runs through UL listed conduit to the other end of the lamp.
- Avoid any sharp bends in the conduit.
- Install UL listed conduit clamps six (6) inches from the #16 x 1000V wire to electrode wire connection and every four feet thereafter.
- Replace ballast covers and screws.
- The ballast wire to electrode wire connection consists of a minimum of five (5) wraps.
- Secure a UL listed silicon electrode boot in place to cover the two ballast to electrode connections.

Installation instructions (continued)

E. Two Lamp Normal and High Power Factor Ballast Wiring

- Use UL listed #16 stranded or solid copper wire rated at 1000V.
- Wire two additional white neutral feeds to the primary neutral wire inside the primary wiring compartment of the ballast. Run these feeds through UL listed conduit to the center two electrodes. Run one wire to each electrode.
- Run the red lead through UL listed conduit to one end of the two lamps.
- Run the blue lead through UL listed conduit to the other end of the two lamps.
- Avoid any sharp bends in the conduit.
- Install UL listed conduit clamps six (6) inches from the #16 x 1000V wire to electrode wire connections and every four feet thereafter.
- Replace ballast covers and screws
- The ballast wire to electrode wire connection consists of a minimum of five (5) wraps.
- Secure a UL listed silicon electrode boot in place to cover the four ballast to electrode connections.

F. Tube Supports

- Tube supports are used to secure the cold cathode lamp in position.
- For straight lamps a minimum of two supports are required, one support 9” from each end.
- For curved lamps, three supports per lamp are required, one support 9” from each end and one support on center of the lamp.

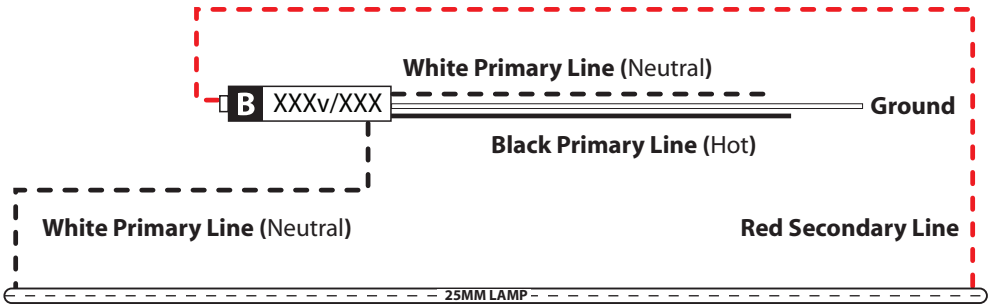
G. Lamp Spacing

- Lamp ends should be spaced approximately ¼” apart.
- Care must be taken so that lamps do not hit, end to end on installation. This may cause one or both lamps to break.

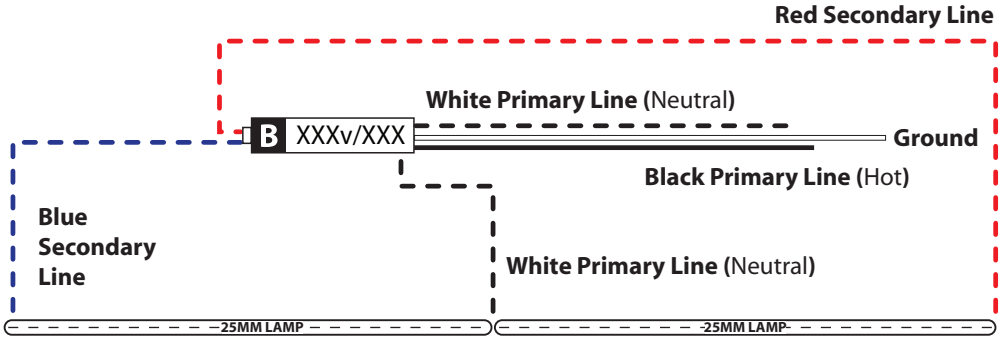
***Installation must be in total compliance with the National Electric Code, Underwriters Laboratory and all applicable local codes.

One and Two Lamp Wiring for FRANCE 150ma and 200ma Ballasts

One Lamp Doubleback Wiring Diagram for Commercial Applications



Two Lamp Doubleback Wiring Diagram for Commercial Applications



Installation Instructions

E~Tech™ 120ma and 240ma Ballast Systems using Lamps with European Double Back Electrodes

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Follow these instructions for the installation of this type of cold cathode lighting system. (Under 1000V normal or high power factor ballasts)

Installation of the Ballast

A. Ballast Location

- Mount ballast as close as possible to the center of the lamp (in one lamp applications) or the center electrodes (in two lamp applications).
- Ambient temperature not to exceed 40 C.
- When not using a raceway, attach and use the optional wiring compartments for all primary and secondary connections. When using the optional wiring compartments, always mechanically bond to case and green wire using star washers to break paint surface.

B. Ballast Mounting

- Mount ballast to a metal stud or other solid structure capable of supporting its weight (approximately 2 ½ pounds).
- Attach ballast with a minimum of two (2), preferably four (4) bolts or screws. Each bolt or screw must be capable of supporting the entire weight of the ballast.

C. Wiring the Primary Circuit of the Ballast

- The primary side of the ballasts are 120V, 240V or 277V running at 60Hz and must be powered by a dedicated and grounded circuit.
- Connect primary conduit to primary wiring compartment. Insure that polarity is correct. Black is hot and White is neutral.
- Insure that the ballast is properly grounded using the green ground wire.

D. Secondary Wiring

- The secondary leads should be run through UL listed non-metallic conduit. If metallic conduit is used, **DO NOT**, under any circumstances, install the ballast with more than one lead in each conduit.
- Keep secondary leads as short as possible.
- Maximum lead length: **DO NOT** use with secondary lead lengths longer than 13 feet in metallic conduit or 25 feet in non-metallic conduit. Use of lead lengths in excess of these lengths will cause ballast damage.

E. Wiring of one lamp at 120ma

- Connect one blue lead and one red lead to the electrodes of the tube.
- Cap off the remaining red and blue leads individually with wire nuts so as to isolate them from any conductive material.
- The ballast wire to electrode wire connection consists of a minimum of five (5) wraps.
- Secure a UL listed silicon electrode boot in place to cover the two ballast to electrode connections.
- Install UL listed conduit clamps six (6) inches from the ballast wire to electrode wire connections and every four feet thereafter.
- Avoid any sharp bends in the conduit.

Installation instructions (continued)

F. Wiring of one lamp at 240ma

- Connect both blue leads together and attach to one electrode.
  Connect both red leads together and attach to the other electrode.
- The ballast wire to electrode wire connection consists of a minimum of five (5) wraps.
- Secure a UL listed silicon electrode boot in place to cover the two ballast to electrode connections.
- Install UL listed conduit clamps six (6) inches from the ballast wire to electrode wire connections and every four feet thereafter.
- Avoid any sharp bends in the conduit.

G. Wiring of two lamps at 120ma

- Connect one blue lead and one red lead to the electrodes of the first lamp.
  Then connect one blue lead and one red lead to the electrodes of the second lamp.
- The ballast wire to electrode wire connection consists of a minimum of five (5) wraps.
- Secure a UL listed silicon electrode boot in place to cover the four ballast to electrode connections.
- Install UL listed conduit clamps six (6) inches from the ballast wire to electrode wire connections and every four feet thereafter.
- Avoid any sharp bends in the conduit.

H. Tube Supports

- Tube supports are used to secure the cold cathode lamps in position.
- For straight lamps a minimum of two supports are required, one support 9” from each end.
- For curved lamps, three supports per lamp are required, one support 9” from each end and one support on center of the lamp.

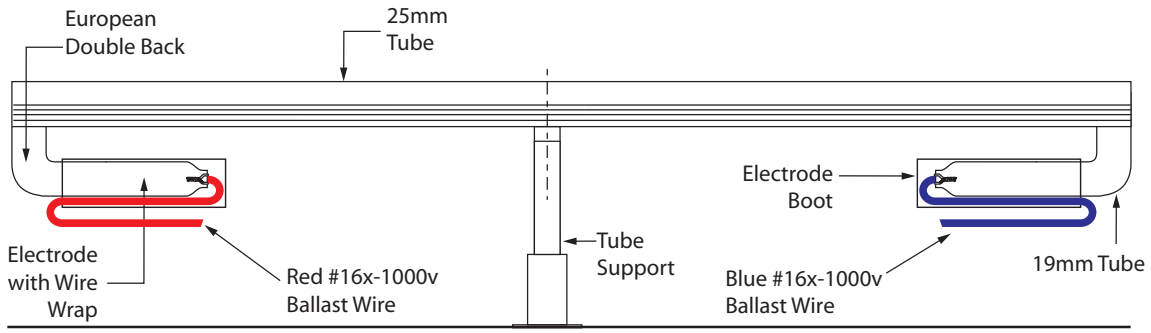
I. Lamp Spacing

- Lamp ends should be spaced approximately ¼” apart.
- Care must be taken so that lamps do not hit, end to end on installation.
  This may cause one or both lamps to break.

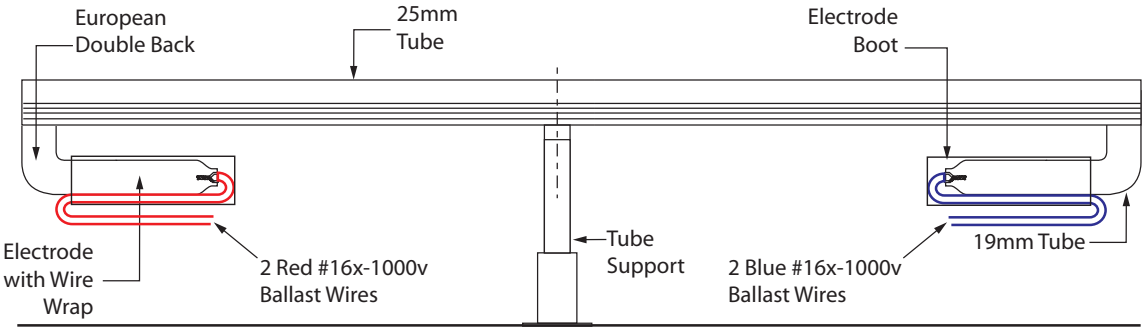
***Installation must be in total compliance with the National Electric Code, Underwriters Laboratory and all applicable local codes.

One and Two Lamp Wiring for E~TECH 120ma and 240ma Ballasts

One lamp operating at 120ma



One lamp operating at 240ma



Two lamps operating at 120ma