

Installation of 600V Class Current Sensors on Higher Voltage Conductors



HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Follow safe electrical work practices. See NFPA 70E in the USA, or applicable local codes.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Read, understand and follow the instructions before installing this product.
- Turn off all power supplying equipment before working on or inside the equipment.
- Use a properly rated voltage sensing device to confirm power is off.
DO NOT DEPEND ON THIS PRODUCT FOR VOLTAGE INDICATION
- Only install this product on insulated conductors.

Failure to follow these instructions will result in death or serious injury.

The information provided herein is intended to supplement the knowledge required of an electrician trained in high voltage installations. There is no intent to foresee all possible variables in individual situations, nor to provide all training needed to perform these tasks. The installer is ultimately responsible to assure that a particular installation will be and remain safe and operable under the specific conditions encountered.

Introduction

It is common practice in the electrical industry to apply 600 volt class current sensors to insulated conductors carrying substantially higher voltages. Emphasis should be placed on design and technique, as proper application methods are a must for long-term safety. The local electrical inspector should be consulted in advance, as there are a few localities where this method is not permitted.

This information is intended for factory-insulated wire, with doubled layers of insulation of sufficient capacity to provide suitable electrical isolation between high voltage conductors/components and the current sensor to be installed. Enhanced protection for bare conductors against abrasion or damage, corona and leakage paths and other environmental effects are not adequately considered here.

Design Considerations

The proposed installation space should be evaluated to ensure that the wiring volume assigned to the enclosure listing is adequate to accommodate the dimensions of the current sensor and associated wiring to be employed, in addition to any existing wiring and devices.

Physical clearances between uninsulated or inadequately insulated components carrying voltages higher than the rating class of the current sensor and the sensor itself (as well as connected signal or communications wiring) must be maintained to levels shown in the appropriate electrical code tables. Particular attention should be paid to the required distances to terminations and other uninsulated points.

Provision should be made to account for the installation category, environmental conditions and pollution degree to be encountered in the specific installation.

Materials

1. Insulation: The high voltage conductors will need to be provided with additional insulation to allow the use of lower voltage class current sensors around them. Approved tapes or insulating sleeves may be employed. The insulating material used must provide a B.I.L. high enough for the applied voltage and conditions, as shown in the code (U.S. NEC 2005 Table 490-24).
2. Restraining device(s): The current sensor(s) and associated wiring will need to be mounted or restrained within the insulated area. Common materials for this purpose include accessory mounting brackets provided by the current sensor manufacturer and/or insulating wire ties.

Procedure

1. Disconnect power to the conductor.
2. Ensure that the conductor is clean to allow insulating tapes to properly adhere to the conductor. Ensure that there are no sharp protrusions which might produce arcs or damage insulating materials or the components to be installed. Ensure that there is a path directly away from the high voltage conductors that is suitable for the communications/signal wiring.
3. Ensure that moving parts such as doors and interlocks will not interfere with the installation, damage wiring, or reduce clearances below required distances in the case of voltage carrying parts.
4. Refer to Figure 1. Check national and local codes to determine the clearance distance ("B") required for the voltage applied (Table 490-24 of U.S. NEC 1999). Determine the clearance distance required from terminations or other bare conductors ("A").
5. Apply tape (Figure 2) or insulating sleeves (per manufacturer instructions) to cover each high voltage conductor for a minimum length of twice the distance "B" (from Figure 1) plus the width of the current sensor to be mounted over the conductor.
6. Mount the current sensor over the center of the added insulation using wire ties and/or brackets. Avoid damaging the insulation layers while mounting the current sensor. Reminder: current sensors demonstrate optimal accuracy when the monitored conductor(s) are centered within the "window" of the sensor.
7. Route communications/signal wiring directly away from the high voltage conductor(s). Retain clearances as required to any other high voltage points. Restrain the wiring as needed to assure that it cannot come within the prescribed clearance distance from any high voltage point.

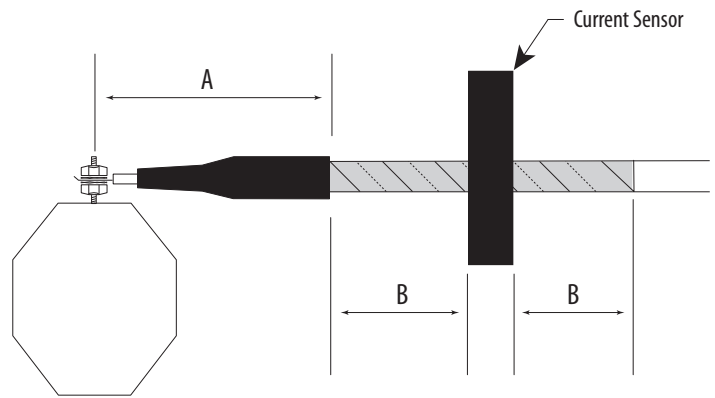


Figure 1

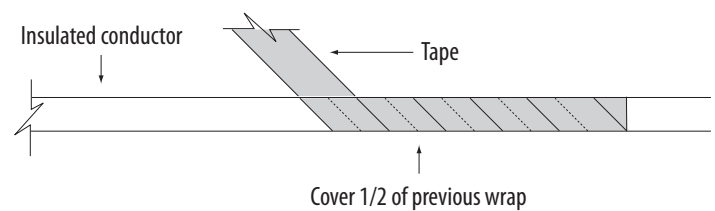


Figure 2