



Installation Guidelines

Multicore Current and Voltage Sensor using Polysil Insulation

15kV P/N 965x/E..., 25kV P/N 966x/E..., 35kV P/N 9670/E...



DANGER

The sensor must be solidly grounded to earth before it is energized. Connection to the phase conductor will energize the sensor and will result in high voltage across the output **unless the sensor is grounded AND the signal cable is connected to the sensor**. Failure to ground before energizing can result in serious injury or death.

DANGER

An energized conductor must be isolated from the sensor during installation per your company's work practices. Insufficient electric insulation or electrical clearance between an energized conductor and the sensor during installation can result in serious injury or death.

DANGER

Sensor must be applied within its electrical and mechanical ratings. Application of sensor in excess of its ratings can result in immediate or delayed electrical or mechanical failure. Failure to apply the sensor within its ratings can result in serious injury or death, or in premature failure of the sensor.

DANGER

Do not drop. While extremely durable, the sensor is cast from a material that can fracture if dropped onto a hard surface. Fractures can result in either catastrophic failure of the sensor upon energization resulting in serious injury or death, or in premature failure of the sensor.

CAUTION

Sensor must remain in packaging during transportation to installation site. Transportation of the sensor without its protective packaging may result in chips, cracks, or fractures to the sensor body. Physical damage can result in premature failure of the sensor or reduced electrical ratings.

CAUTION

Both the sensor cable connectors and the cable connector located on the sensor must remain dry and protected from inclement weather. The connectors are weatherproof once joined, but may allow moisture in the cable when the male or female connectors are left exposed to the elements. Moisture in the cable will result in inaccurate measurement readings.

WARNING

DO NOT HIPOT. HIPOT (high potential) testing will thermally damage the resistor assemblies in the sensor causing permanent damage. HIPOT testing voids the sensor's warranty. If a HIPOT test is necessary, contact Lindsey for alternate product intended for HIPOT.

Specifications:

ELECTRICAL RATINGS:			
CATALOG NUMBER SEQUENCE	965x/E...	966x/E...	9670/E...
INSULATION CLASS	15kV	25kV	35kV
IMPULSE (BIL)	110kV	150kV	200kV
LEAKAGE DISTANCE (in.)	15.8	24.5	36.5
DRY ARC DISTANCE (in.)	8.8	12.6	17.2
OVERALL HEIGHT (in.)	13.2	16.7	21.8
WITHSTAND (1 min.)	34kV	40kV	50kV
CORONA (extinction)	11kV	19kV	26kV

MECHANICAL:			
INSULATION CLASS	15kV	25kV	35kV
CANTILEVER STRENGTH (Ult. lbs.)	2,800	2,800	2,800
WEIGHT (lbs.)	39	49	59
SHIPPING WEIGHT (lbs.)	44	54	64

Characteristics:

Lindsey Multicore sensors provide highly accurate voltage and/or current sensing for 15 to 35kV systems and offer greatly simplified installation process compared to conventional PTs and CTs. Unlike other sensors, no calibration is required for line conductor diameter.

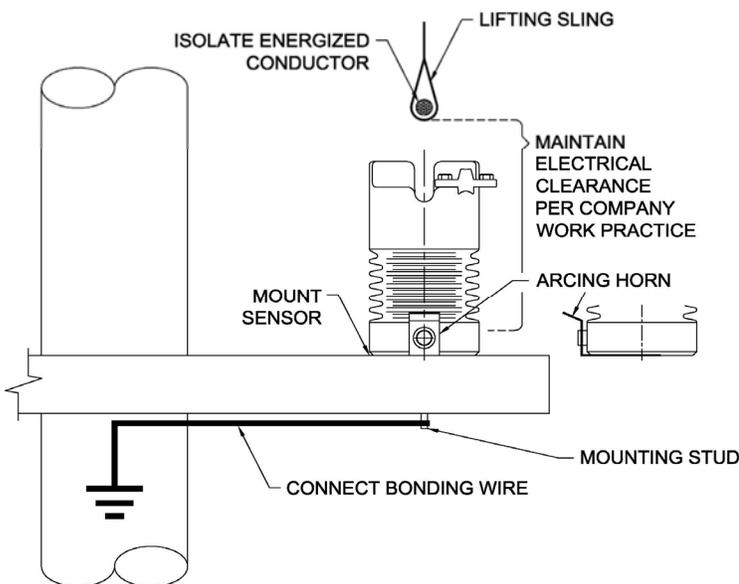
The sensor can be mounted vertically or horizontally to replace any standard insulator with the conductor held precisely by dual clamps. The deep groove design places the current path at the center of multiple sensing cores that are embedded inside the solid insulator. Overall symmetry of the internal sensing system ensures high accuracy when used with conductor diameters from 0.25 to 1.25 inches. To retain compatibility with existing cap controllers and RTU's, the current signal output ratio has been set to 600A:10V with zero phase shift.



DANGER

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Figure 1.



Installation:

Included with the Multicore sensor is an arcing bracket (also known as an arcing horn), P/N 9609 (See Figure 9) which will be installed under the sensor per Figure 1. Mounting the sensor to the crossarm will require a

mounting stud which is not included. If needed, these are available from Lindsey (See Table 2 for ordering information).

The Multicore Sensor is designed to be installed without de-energizing or cutting the main utility conductor.

1. Using the sensor catalog number, use the Specifications table to ensure the sensor is being applied in accordance with its ratings.
2. Per your company's work standards, either lift the conductor up away from the work area to ensure a proper and safe AC line work minimum approach distance (see Figure 1). See Table 1 for clearance recommendations. As an example, the conductor may be lifted using a sling as shown in Figure 1. The sling could be attached to a bucket truck, a lift, a hotstick, or other insulated arms typically used to change out a cross arm. As an alternative to lifting the conductor, apply sufficient external insulating blankets (see Figures 2 & 3) to ensure proper and safe electrical clearances.
3. Installation requires an appropriate 3/4"-10 line post mounting stud. These are available from Lindsey (not included). See Table 2. If replacing an existing insulator, remove the existing insulator using approved work methods. Place the provided arcing bracket (see Figure 9) underneath the Multicore sensor and mount both on the crossarm. The connector socket on the Multicore sensor must be aligned with the hole in the arcing bracket. See Figure 1. Install the Line Post Mounting Stud in the base of the sensor and install on the crossarm. Rotate the sensor to place "H1" towards the feeder source. "H1" is always opposite the signal cable connector. "H1" is marked adjacent to the conductor groove.

4. Grounding procedure:

⇒ **For units equipped with optional ground stud (see Figure 9):** Thread a grounding wire (#4 copper wire recommended) through the 0.25" hole of the grounding insert at the bottom of the sensor and then tighten the 3/8-16 bolt.

⇒ **For units without the optional grounding stud:** Tighten the nut on the mounting stud nut against a square washer on the crossarm. Add two square washers, double coil lock washer, and square nut to stud and loop a No. 6 (typical) solid copper ground wire between washers and tighten nut. (See Figure 1).

Connect the ground grounding jumper to a low resistance (<5 Ohms) pole ground.



Figure 2. Example use of insulating blankets to shield live line from sensor connector area.



Figure 3. Example use of insulating blankets to shield sensor connector area from live line.

5. Connect signal cable to the sensor while maintaining the safe and proper electrical clearances established during Step 2. See Figure 4.

⇒ **For bayonet style connector**, (see Figure 5) gently rotate the outer collar of the cable connector until you feel the slots in the cable align with the pins on the female base which is molded into the sensor.

Push gently until the cable is seated against the sensor. Rotate the connector collar of the cable connector 1/4 turn clockwise until you feel a "click" as the connector halves seat into each other.

CAUTION

Do not over-tighten the screw type connector. Over tightening can displace the internal O-ring allowing moisture to enter the cable. Moisture in the cable will result in inaccurate measurement readings.

⇒ **For screw type connectors**, hand-tighten to 18-20 ft-lb. See Figures 6 & 7 for the two types of available screw-type connectors.

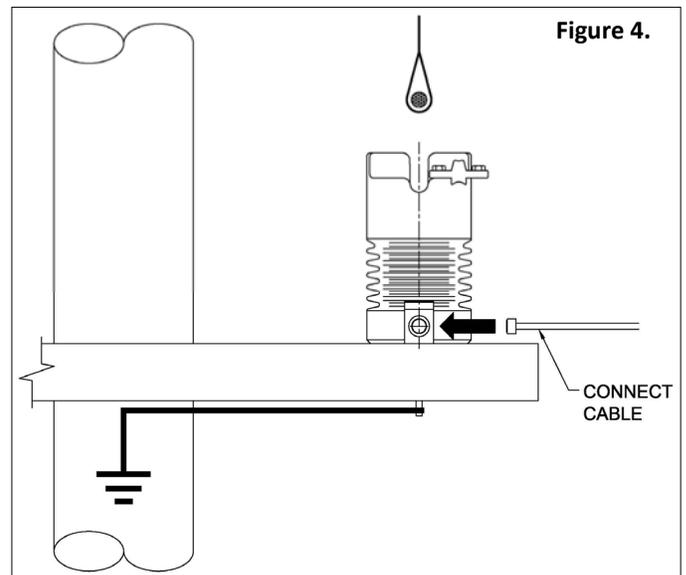


Figure 4.

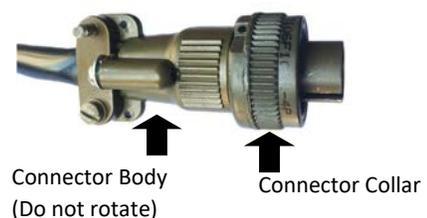
Figure 5. Control cable connector detail for bayonet style connector



Figure 6. Control cable connector detail for Amphenol-style screw type connector



Figure 7. Control cable connector detail for ITT Cannon-style screw type connector



Lindsey Installation Guidelines

Multicore Current and Voltage Sensor

- Secure the control cable with wood staples to crossarm or route inside conduit being careful not to crimp or damage the signal cable. Now, connect the cable to the controller.

NOTE: When bringing the far end of the cable into a control cabinet, make sure the hole or cable gland in the cabinet can accept the following connector or cable diameters for proper pass through.

Cable End	Min. Hole or Gland Dia.
Pigtail	0.635 in. (16 mm)
Single Sensor Connector	1.46 in. (37 mm)
3-to-1 or 4-to-1 Sensor Connector	2.00 in. (51 mm)

Table 1.*

Voltage Class KV phase-phase	Distance to Workman
15kV	26 inches (660 mm)
25kV	31 inches (790mm)
35kV	31 inches (790mm)

*National Electric Safety Code C2-2007, IEEE, 2007, Table 441-1, p. 266

Table 2. Accessories

Part #	Description	Note
2004	Horizontal mounting base	Optional
2040	3/4" x 2 3/16" mounting stud for metal cross-arms	Optional
2041	3/4" x 7" mounting stud for wood cross-arms	Optional
R-23741	Extra Hotstick keeper set (2 keepers and bolts)	Optional
R-26525-1	Arcing Horn	Included

- Install conductor into the top groove of the Multicore sensor. Conductor keepers are reversible: one side accepts conductors ranging from 0.25 inch to 0.73 inch diameter; flipping over the keeper will allow it to accept conductors from 0.73 to 1.25 inch diameter. The conductor keeper MUST make good electrical contact with the conductor in order for the voltage sensing element to operate properly. If the conductor is corroded or dirty, clean with a wire brush before affixing the conductor keepers. If preferred, armor rod may be used without affecting accuracy. Tighten clamping bolts (See Figure 8).
- Installation is complete.

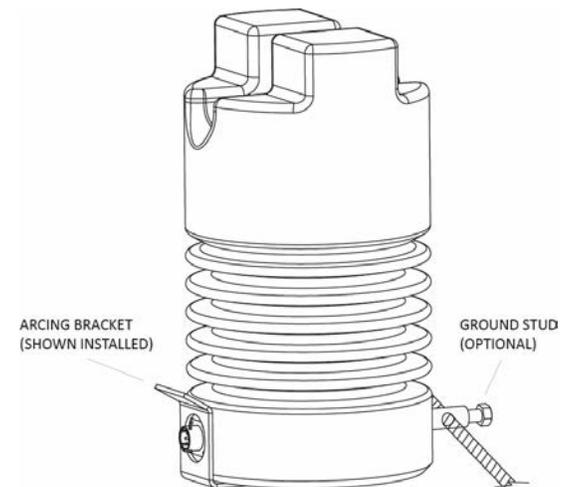
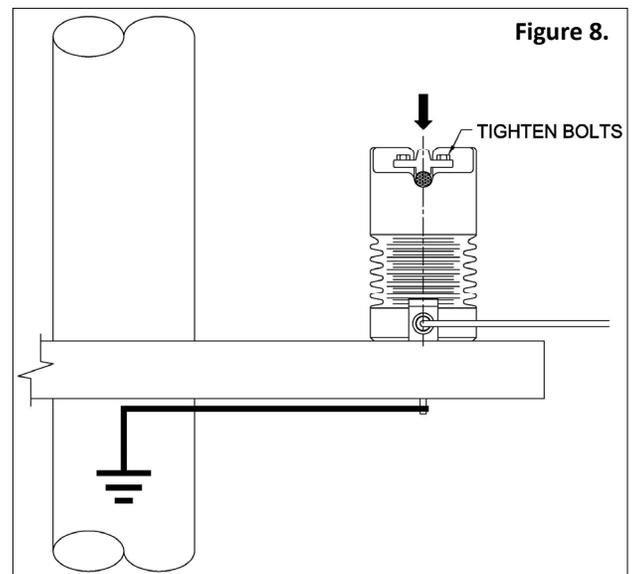


Figure 9. Location for Optional Ground Stud and for Installing Arcing Bracket (P/N 9609)