

# VerifEye™ Series 4000/4100 Metering on a Three Phase, Four Wire Delta Service

**Product:** VerifEye™ Series 4000/4100 Meters

**Article ID:** 060517-aa-01

**Date:** June 5, 2017

**Summary:** This article summarizes the application of the Series 4000/4100 Meters on a three phase, four wire delta service for a cost-effective solution for monitoring multi-phase tenant energy usage.

**Information:** *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.*

**⚠ DANGER ⚠**

**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.

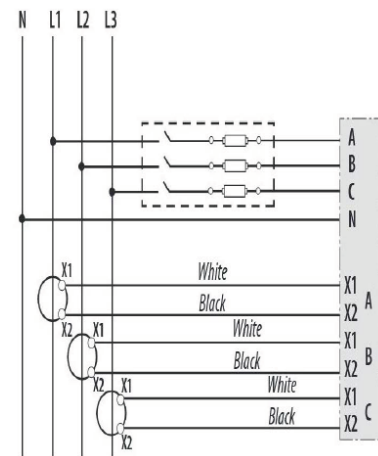
**Failure to follow these instructions will result in death or serious injury.**

## Theory of Operation for Electronic Power Meters

Electronic power meters provide a cost-effective means of monitoring multi-phase tenant energy usage using an existing building automation system with totalizing and/or analog input capability. These meters use split-core, high-accuracy current sensors to measure the current flow on each of the phases with no need for expensive rewiring. The voltage on each phase is monitored using input wiring directly into a breaker or other convenient connecting location. The instantaneous current in each phase is multiplied by the instantaneous voltage on the corresponding phase several times per cycle.

## Introduction

A four-wire delta (4WD) electrical service, also known as a “high-leg”, or “wild-leg” is a three-phase delta service with a center-tap on one of the transformer windings to create a neutral for single-phase loads. Motor loads are commonly connected to phases A, B, and C, while single-phase loads are connected to either phase A or C and to neutral. Phase B, the “high” leg, is not used for single phase loads. This service usually has a neutral connection, but in some situations, the neutral conductor is not available.

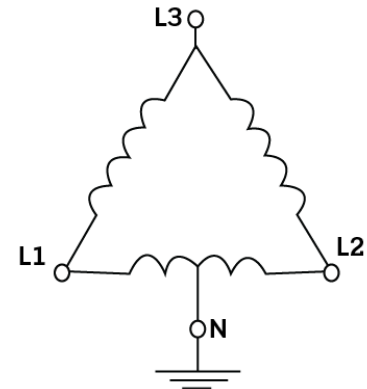


**3-Phase 4-Wire Wye/4-Wire Delta\* Direct Voltage Input with 3 CTs**

Use System Type 40 (3L+1N)

*\*If the service is imbalanced, you may need to adjust the phase loss imbalance settings to meet the service needs. The default setting is 25% (0.25).*

It generally exists at the service entrance, but may not run to the panel or load. In theory, a four-wire delta without neutral is just a three-phase delta, but there is one difference. In a normal three-phase delta, ground will either be the center voltage or one leg, but a three-phase delta derived from a four-wire delta transformer will have ground halfway between two legs. The Series 4000 Meter is suitable for this service, as they will work with or without a neutral connection.



Wide Leg/High Leg Delta

Due to the voltage variance in a "high leg" (4WD) electrical service, adjustment to the imbalance alarm setting on the Series 4000/4100 Meters may be necessary. This adjustment will avoid the phase loss alarm LED from going into alarm due to the variance in voltage. On the meter display menu, go into SETUP>SPLOS>IMBAL and change the value from 0.25 to a percentage that is acceptable for the imbalance (.50 or greater). Connecting the ground to control power is always recommended, in imbalanced applications such as a (4WD) it is imperative.

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