



Installation Instructions

H-6014/15

kWH Submeter/Pulse Transducer

VERIS INDUSTRIES, INC.

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Applications

- Energy management & performance contracting
- Submetering for commercial tenants
- Departmental costing for manufacturing
- Allocate costs for concession stands, RV, & marinas

Direct reading display & pulse output

- No confusing multipliers...read display directly
- Maintains reading in event of power loss
- Powered by voltage inputs
- Built-in kWH pulse output for use with automation systems

Easy to install & cost-effective

- Safe, split-core CTs eliminate costly shorting bars
- CTs are rugged and feature positive latching action
- Accurate to +/- 1.0% of reading..true RMS power!
- Two versions...mini-submeter or flush mount for rough-in jobs.
- CT polarity check LED identifies potential wiring errors.
- Compact, lockable enclosure measures just 4.5" x 6.0"



**Warning: Model 6014
designed for 120 VAC
systems only!**

OPERATION

The H-6010 series 1 to 3 phase submeter/pulse transducers are designed for use in industrial, commercial, and submetering & building automation KWH applications. It utilizes safe, low voltage output CTs and direct wired voltage inputs (no expensive voltage transformers required). Pulse (KWH) output are standard. An 8 zone (specify other optional sizes) remote display panel is available for multi-tenant applications.

Accepting three Veris current transformer inputs and three direct connect voltage inputs, the transducer multiplies the input current signal, voltage input, and power factor for each phase to calculate true RMS power. The sensor accumulates this instantaneous value over time and produces a pulsed output proportional to the energy usage (KWH). The frequency of the output pulses is proportional to the total power consumed and can be used to measure energy usage for an entire building, selected area, or individual loads (chillers, compressors, etc..).

The H-6015 accepts any range of voltages from 208 to 480 VAC. Model 6014 accepts 120 VAC.

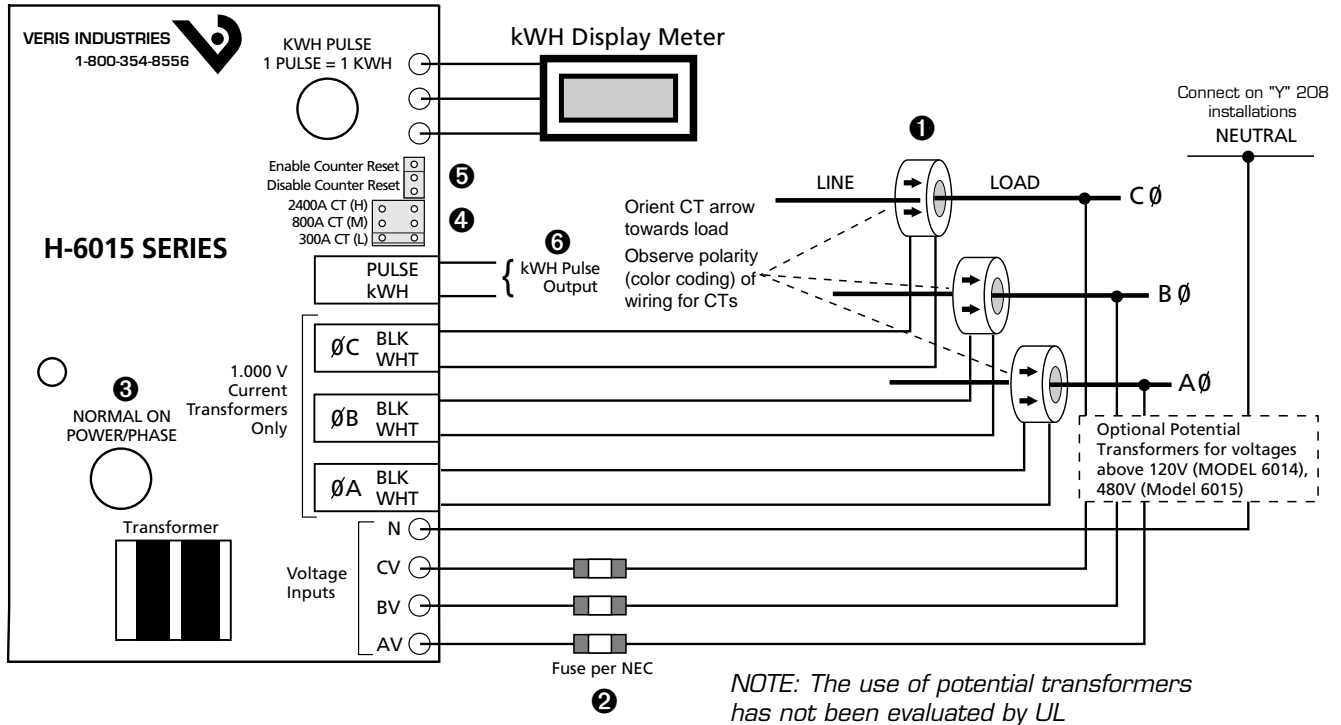


**WARNING--REFER SERVICING TO
QUALIFIED PERSONNEL ONLY!**

- **This product is not intended for life or safety applications**
- **Potential electrocution hazard exists. Installing sensors in an energized motor control center or on any energized conductor can be hazardous.**
- **Read instructions thoroughly prior to install**

Severe injury or death can result from electrical shock during contact with high voltage conductors or related equipment. Disconnect and lock-out all power sources during installation and service. Applications shown are suggested means of installing sensors, but it is the responsibility of the installer to ensure that the installation is in compliance with all national and local codes. Installation should be attempted only by individuals familiar with codes, standards, and proper safety procedures for high-voltage installations.

GENERAL WIRING DIAGRAM



Typical Wiring Diagram

Alternative configurations, see 4, 5, & 6.



IMPORTANT INSTALLATION NOTE

• **This unit accepts 1.0 V full-scale output Current Transformers (CTs) only.**

• **Do not use 0-5A OUTPUT Current Transformers (e.g., 200:5 type CTs) without H-6902B Adapter. Consult Factory**



CAUTION!

IF USING 0-5A CTs, opening the secondary leads of a transformer under load can cause hazardous voltages which can injure personnel or damage the current transformer. Maintain a shorted circuit across the secondary leads whenever the current transformer is not connected to a Veris adapter.

- 1 Accepts 1.0V output CTs only!**
Size CT appropriately for you applications
 CT rating must be greater than maximum current monitored
 Orient CT arrow towards load
 Observe polarity (color coding) of wiring for CTs
 To interface with 5A output CTs, consult factory.
- 2 Mandatory Fuse or breaker per NEC.**
 Max. current draw is 50 mA
 Fuse pack option H-6901 is available. Installer must ensure compliance with local and national codes (100 KAIC max.)
- 3 Phase loss/power LED indicator**
 ON indicates normal; off indicates no power or incorrect phase wiring. See troubleshooting.
- 4 CT size selector. Set to match Veris CT size installed.**
 Set to match CT size installed. Must be 300A, 800A or 2400A CT.
- 5 External Counter Display Reset**
 When enabled, KWH display may be reset externally.
 Disable to prevent tampering.
- 6 KWH pulse output**
 For connection to automation system.
 1 pulse closure = 1 KWH

INSTALLATION

Locate submeter within 30' of current transformers, in an area accessible to qualified service personnel only. Transducer and/or enclosure should be mounted using #10 screws. Unit is intended for dry, indoor use only. The enclosure should be secured with a padlock or nut and bolt.

1. CURRENT TRANSFORMER INSTALLATION

This unit directly accepts Veris 1.0 VAC output CTs.

Ensure that all marking arrows on the CT housings are pointed towards the load being monitored (away from the source!) CTs may be located up to 30' from panel. For runs up to 100' use shielded wiring.

Observe polarity of wiring from CTs. Each CT requires an independent pair of wires. Do not use a common ground! Observe black/white polarity connection. Failure to orient CTs and observe polarities will result in erroneous readings.

2. POSITION CT SIZE SHORTING LINK

Use the shorting link to select calibrate your display to the appropriate CT size as follows:

If CT is 300 A , use 300 CT (L) position

If CT is 800 A , use 800 CT (M) position

If CT is 2400 A, use 2400 CT (H) position



Failure to set link properly will result in faulty readings.

3. OPTIONAL KWH PULSE OUTPUT CONNECTIONS

An optional pulse output is provided for interface with a datalogger, automation system, or the VERIS remote H-6908 display. The output will close momentarily with each kWh accumulated.

4. VOLTAGE INPUT CONNECTIONS



Do not connect voltage inputs live!
Do not apply voltage until all connections are made.

Wires are normally 14 AWG. Terminals will accept 14-26 AWG. Wire strip length is .236" (6mm). Recommended tightening torque 4.5 lbs. in.

If voltage exceeds rating of the submeter (120VAC for model 6014; 480 VAC model 6015), you will need to use appropriately sized external potential transformer(s). See OPTIONAL POTENTIAL TRANSFORMERS (page 4).

Do not apply voltage to inputs until all connections are made.

Fuse connections or utilize breakers per NEC. Fusing is mandatory. (Current draw of unit is less than 50 mA). **NOTE:** Fuse pack H-6901 is rated 100 KAIC max. Sources capable of delivering 100KA interrupt current require alternate fusing. Always ensure fusing complies with local and national electrical codes.

5. POWER UNIT (TURN ON LOAD TO BE MONITORED)

kWH pulse LED will blink with each closure of output. Normal /ON LED will be lit if wiring is correct. If not, consult trouble shooting section.

TROUBLESHOOTING

Problem: Normal ON, VOLTAGE/PHASE LED is OFF.

Solution:

- On initial installation, check AV, BV, CV to ensure phases are not reversed, and that all are connected.
- Check that voltages on phases are above undervoltage set-point.

Problem: Pulse LED does not blink

Solution:

- Ensure monitored load is ON. Ensure fuse or breakers to unit are not blown.
- Verify that CTs are all oriented towards load as indicated on label.
- Verify all CT wiring is correct (polarity of black/white must be observed.)

Problem: Unit output is only a fraction of actual power consumption

Solution:

- Verify that CTs are all oriented towards load as indicated on label.
- Verify all CT wiring is correct (polarity of black/white must be observed.)
- Check that the current and voltage inputs have proper relationship (if voltage legs are reversed, Phase Loss LED will be out).
- Verify that CT size selector switch is set to correct size of CT. See installation step 2.

Problem: The phases are not clearly marked, or difficult to identify:

Solution:

- Before any CTs are connected, the power phase light may or may not be on.
- Put jumpers on the phase B and C CT inputs of the transducer, and connect one of the CTs to the phase A input.
- The power phase light will either be on or off. If the light is on, reverse the wires and see if the light goes out. If it does, the CT is on the correct phase.
- If the light is off when the connection is made, reverse the wires and see if the light comes on. If it does the CT is on the correct phase.
- Repeat steps 2 through 4 for each phase (e.g. put jumpers on phase A and C and connect a CT to phase B), and mark each CT for the correct phase.

KWH DISPLAY

The KWH display is factory wired as shown in the wiring diagram.

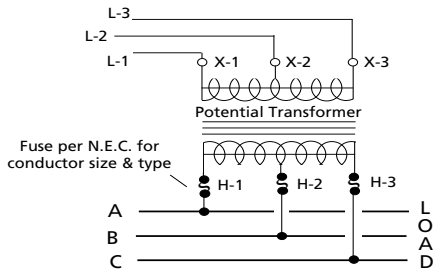
The counter reset may be enabled or disabled with the jumper provided on the PCB. Simply install the jumper in the desired position (enable, disable). This feature is useful for tenant submetering to prevent tampering.

KWH = KWH x Pulses Counted
(consumption)

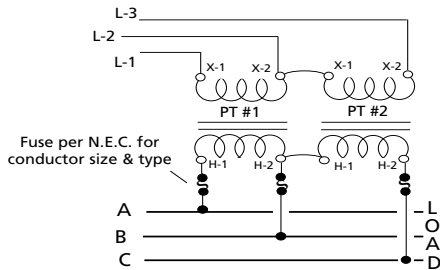
OPTIONAL POTENTIAL TRANSFORMERS

For use with line voltages in excess of 480 VAC (# 6015/6015F) or 120VAC (# 6014/6014F) use an appropriately sized transformer to reduce voltage to match submeter ratings

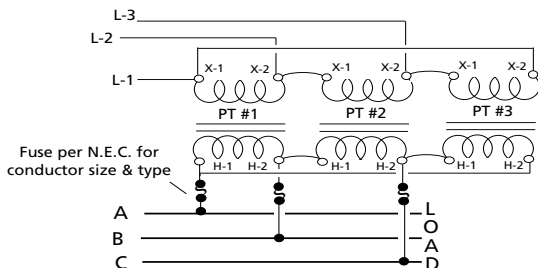
For use with line voltages in excess of 600V



Option #1: Using one open delta three phase potential transformer with 120 VAC secondary



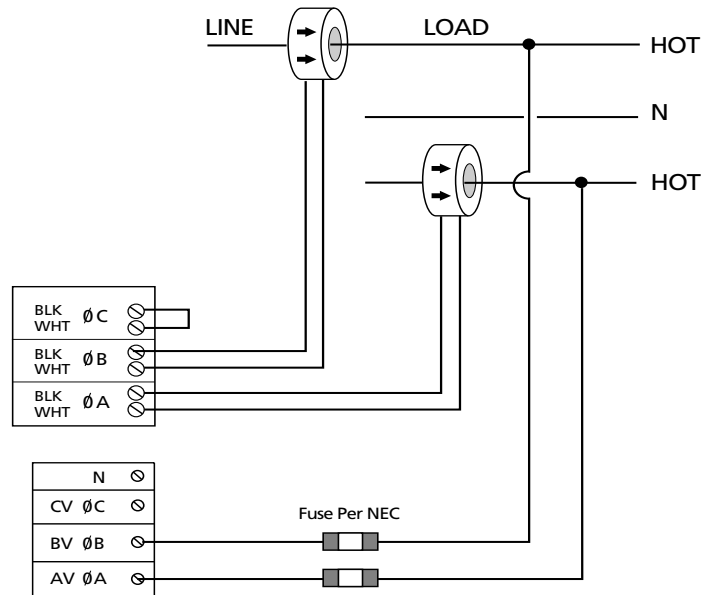
Option #2: Using two single phase potential transformers connected open delta.



Option #3 Using three single phase potential transformers delta connected

NOTE: The use of potential transformers has not been evaluated by UL

SINGLE PHASE 3-WIRE WIRING OPTION



Note: Do not connect neutral (N)

TRANSDUCER SPECIFICATIONS

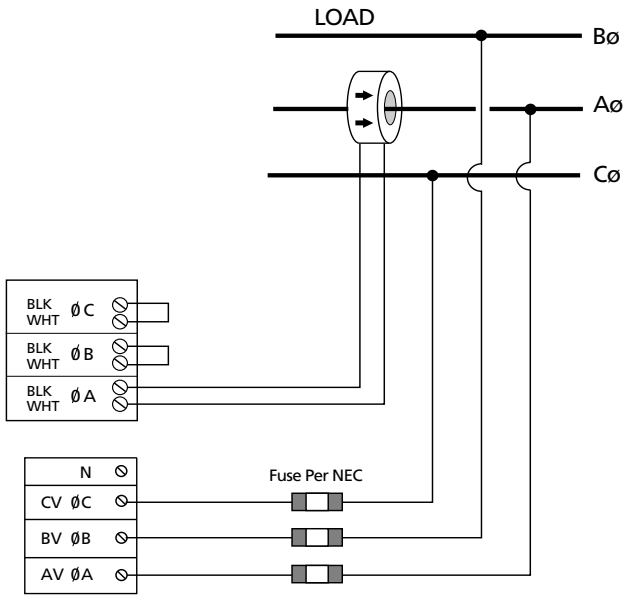
Ratings.....Sized by CT
 Amperage Input.....1.0 V Safe CTs ONLY
 Consult factory for 0-5A output CT interface H-6902A
 Voltage ranges
 6014.....120 VAC
 6015.....208-480 VAC
 Isolation.....2500 VAC rms
 Pulse rate.....1 kWh per pulse
 Pulse output.....N.O., Opto FET, 100 mA @ 24VAC/DC
 Sealing.....N.E.M.A. 1
 Temperature range.....-15 to 85° C
 Humidity range.....0-95% non-condensing
 Enclosure dimensions.....(L x W x D)....4.5" x 6.0" x 4.0"
 Enclosure construction.....Steel, NEMA type 1,
 3/4" & 1/2" conduit knock outs, reversible door w/lock hasp

CURRENT TRANSFORMER SPECIFICATIONS

Output at full-scale.....1.0 VAC
 Accuracy, split-core.....± 0.5%
 Leads.....22 PVC ETD twisted pair, Black/white,
 UL 1015, 8' length

Important note: To interface the transducer to existing 0-5A CTs, you must use an adapter. Consult factory. Failure to use the adapter will damage the unit and may result in hazardous, un-shorted CT conditions.

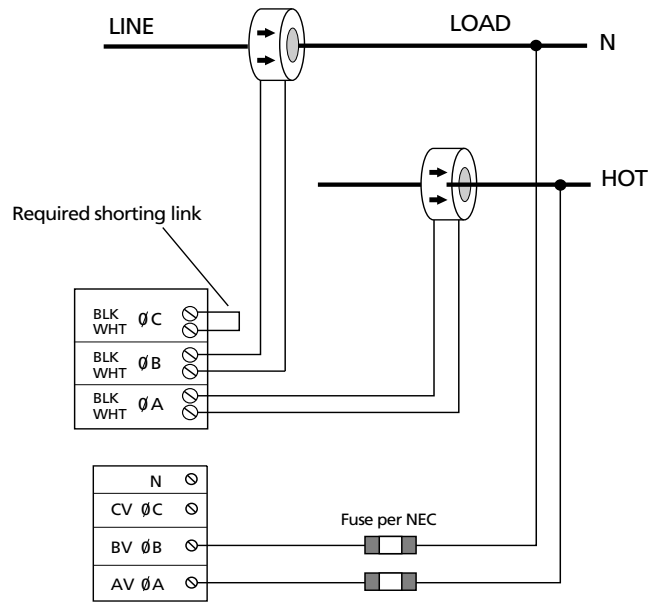
SINGLE PHASE INSTALLATION ON THREE-PHASE BALANCED LOADS



**Multiply Meter Reading 3X
Do not connect neutral (N)**

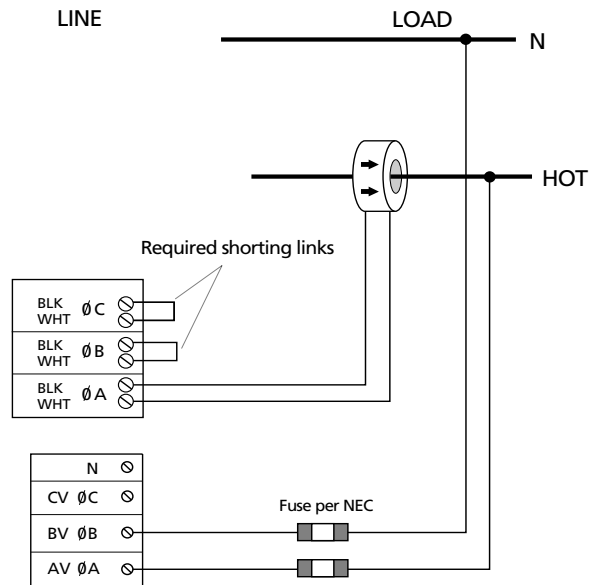
SINGLE PHASE 2-WIRE INSTALLATIONS

PREFERRED METHOD: No Multipliers



Connect neutral line inputs to φB inputs

**ECONOMY METHOD:
2 X Meter Multiplier required**



Connect neutral line voltage to L-2 as shown

OPTIONAL MONITORING OF MULTIPLE LOADS

The Veris 6014/15 are extremely flexible and allows multiple sets of current sensors to be used in parallel so that multiple locations can be monitored by a single meter. This allows for a totalized output from two or more locations.

RULES FOR ACCURATE PARALLEL INSTALLATION

1. Current sensors must be installed in complete sets of three (3) when used for paralleling. This is necessary when paralleling poly- with single-phase sources.
2. All parallel current sensors must be of the same rating (e.g., all 300A (Low)).
3. All locations being monitored must have the same power source. Even with identical voltages, you must not violate this rule.
4. The output registered by kWh display must be multiplied by the number of CT sets. (i.e., with two sets your new KWH reading = meter reading x 2.

