

## Power Meter PM-2106

Power Meter PM-2106 is designed by Intech 21, Inc. for the purpose of accurate metering of the electrical power, voltage, consumed energy and demand in “ $\Delta$ ” or “Y” three-phase power distribution system.

The PM2106 is a multifunctional device featuring configurable power quality and electrical energy meter with built-in wireless radio communication interface, wired communication interface with MODBUS protocol, LCD display and internal temperature sensor and add-on multipurpose I/O channels.

Embedded Radio Communication Device is configured as a Wireless Network Node, allowing the Power Meter to participate in the Intech21 Wireless Control Network.

The Wireless Control Network is designed to simplify deployment and reduce the cost of installation of the Building Monitoring and Control System, which standard operation is to perform a variety of Data Acquisition and Control functions, e.g. Power Meter reading, Smoke Detector monitoring, Temperature Sensor reading, Electrical Heating/Cooling control, and operating the Electrical Power Load Control devices for power savings etc. The system is WEB-enabled, with the purpose of easy user access via the Internet to the building's real-time data as well as to the information stored in the Central Database.

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As the Wireless Network has self-configuring features with an intrinsic structural hierarchical organization, the network units do not require hardware preprogramming prior to or during installation and the units are easily interchangeable, which reduces the possibility of installation errors by personnel.

The Wireless Network operates in 902-928MHz frequency band dedicated for non-licensed Industrial Scientific Medical (ISM) applications in the USA. Versions for other frequency bands are also available.

The Power Meter's LCD display shows measured real-time data and capable of displaying text messages provided by the System, e.g. billing information to the tenants. The LCD backlight can be turned on/off remotely to attract attention to a new message.



Fig. 1 Front view

## 1. Specifications

Power Meter Type	Four Wire Three-Element Transformer rated Solid-State Meter
Baseline Standards	ANSI C12.1, ANSI C12.16, UL3111-1, CSA22.2 NO. 1010-1
Voltage and Frequency rating	110 - 480V, 60 Hz
Voltage Input Configuration	Three-phase, 4-wire: Line A, Line B, Line C and Neutral
Voltage Input	110-480 V RMS Connecting Wires: 14AWG to 12AWG
Current Input	External Current Transformers.
Measured Parameters	Accumulated Energy; Voltage per phase in range 100 – 600V; Current per phase in programmable range; Active Power per phase; Reactive Power per phase; Apparent Power per phase; Power Factor per phase; Frequency; Temperature; Energy usage in a demand interval (may be 1 to 60 minutes); Current Demand calculated according one of five standard methods; Peak Demand since last reset; Peak Demand Time;
Display data representation	The LCD display on the front panel of the power meter has four 20-character strings.
Data Retention	Data flash memory on PM2106DM allows optional logging of measured data. Energy usage may be saved in a log for each demand interval and may be retrieved by the MODBUS.
Power Consumption	Not more than 4W
Display	LCD display 20x4 characters
Interface	RS485, MODBUS
Enclosure	type NEMA 4X, PJU86LWF size 9.6 x 7.5x 5.2
Weight	
Environmental Conditions	Indoor and outdoor use. Placement: Enclosed Power Distribution Panel Temperature Range: -20°C to +50°C. Note: Limited by LCD temperature range Altitude up to 2000m Maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40 °C POLLUTION DEGREE 2 in accordance with IEC664

## 2. Measurement wiring diagram

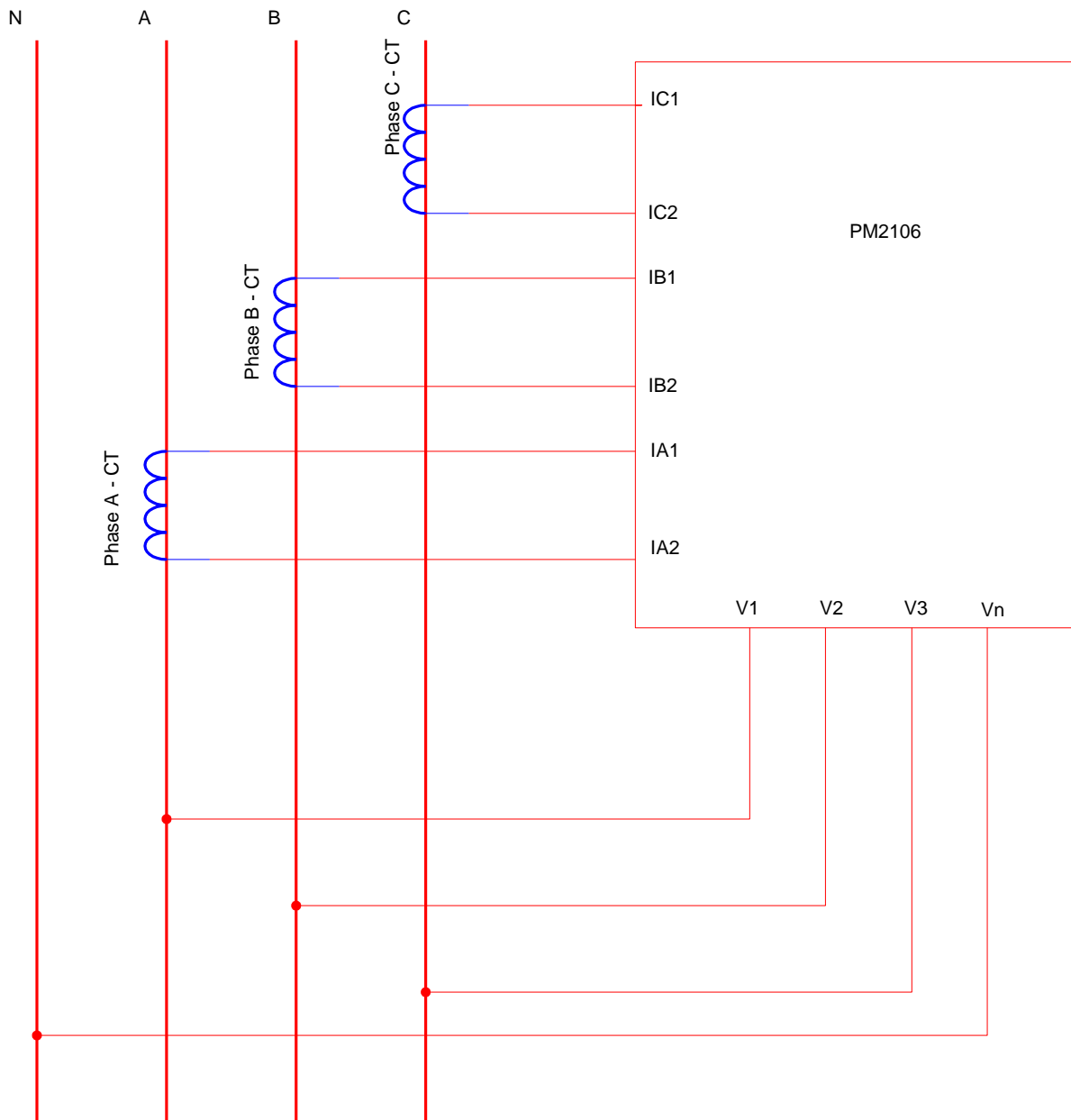


Fig. 2 “Y” Connection Diagram.

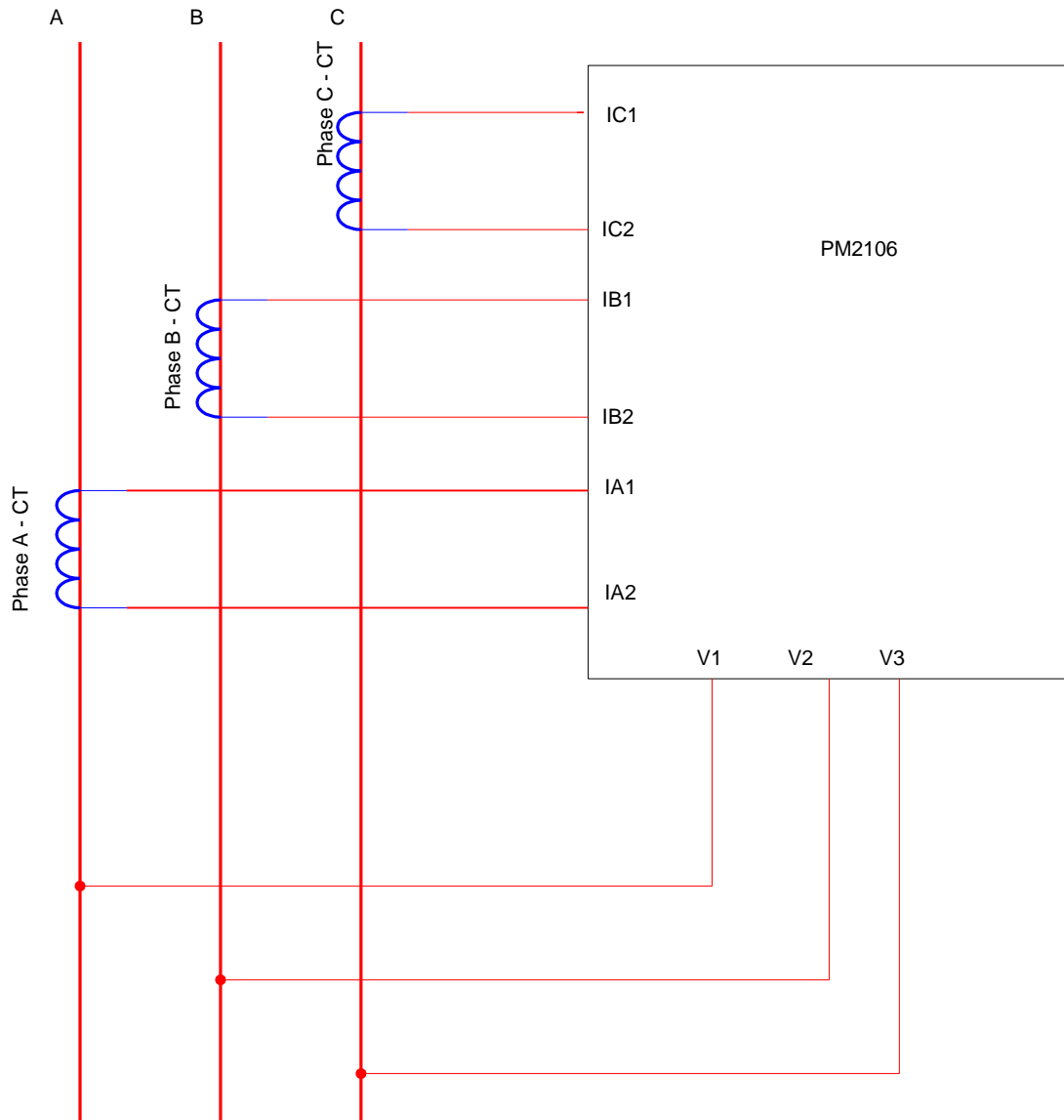


Fig. 3 “Δ”- Connection Diagram

### 3. Wiring and connections.

- 3.1 Low voltage RS485 communication line is isolated from voltage and the current power and measurement circuits. If used it should be laid in separate conduit through separate opening in PM2106 enclosure.
- 3.2 All electrical connections between PM2106 voltage inputs and current sensing (coming from CTs) wires (at least AWG18 or thicker) should be made in standard UL approved splicing box Type 4X supplied by the electrical contractor. All the necessary conduit and fittings should be Type 4X.

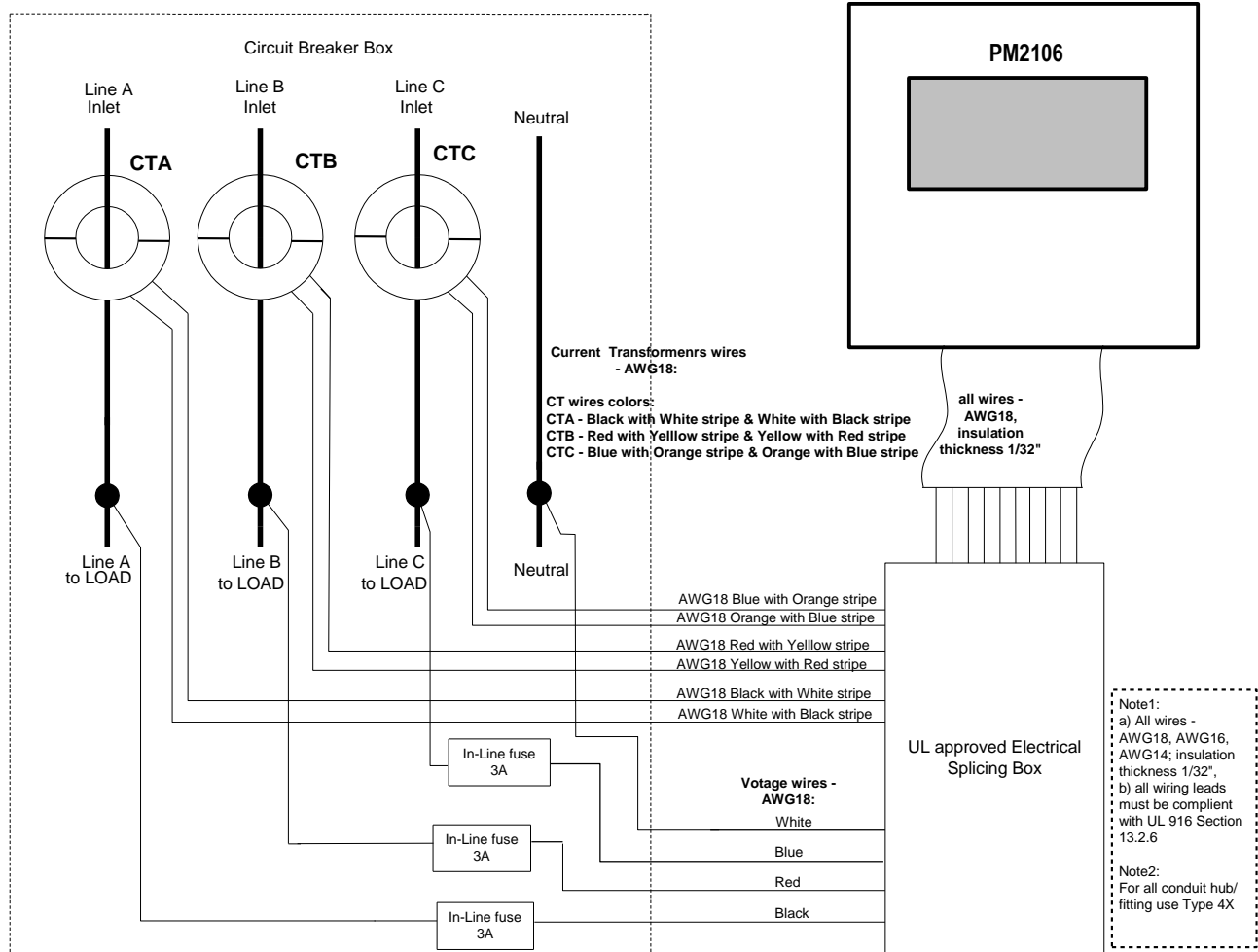


Fig 4. Connection of PM2106 in Y-scheme

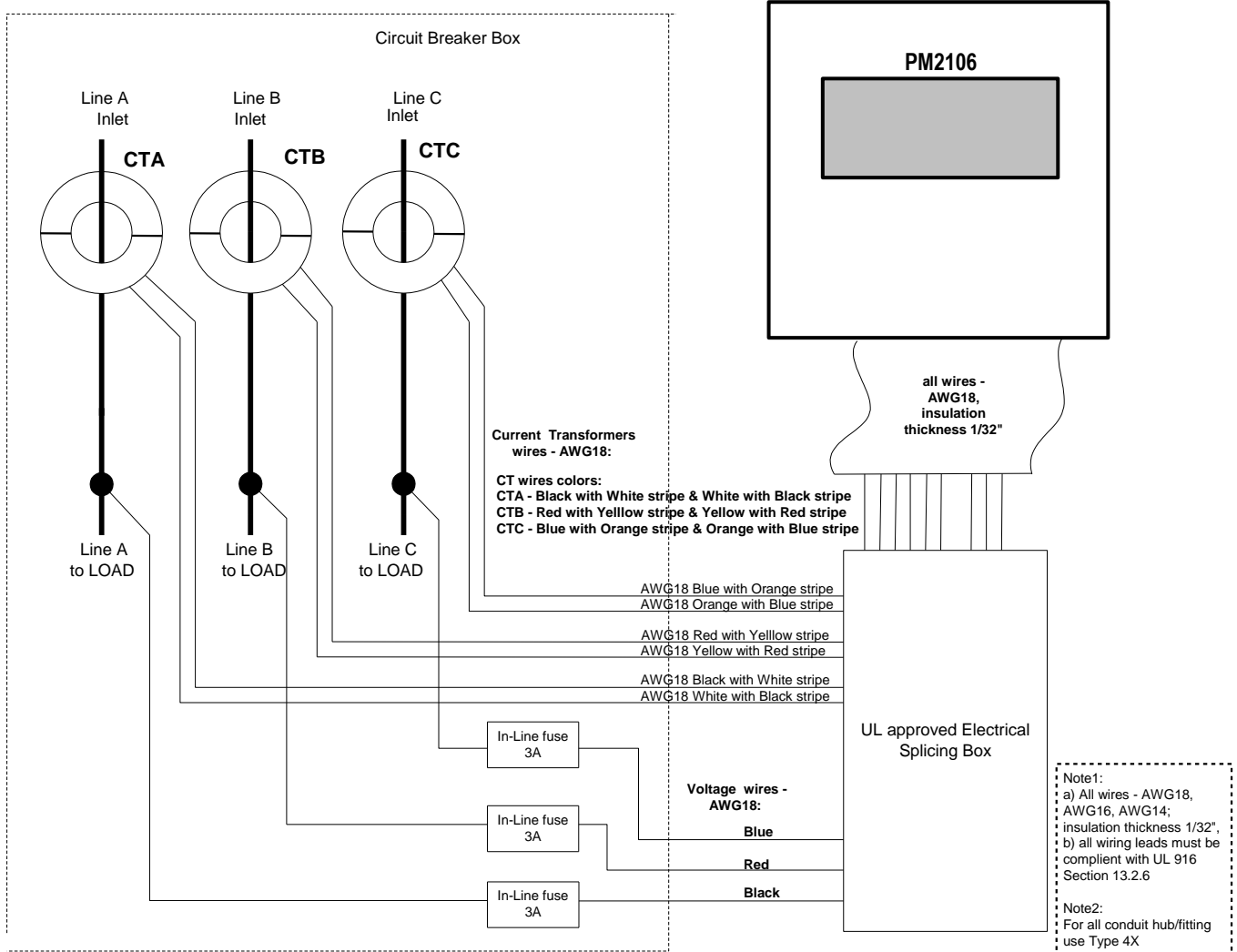


Fig 5 Connection of PM2106 in DELTA scheme.

Enclosure mechanical drawings:

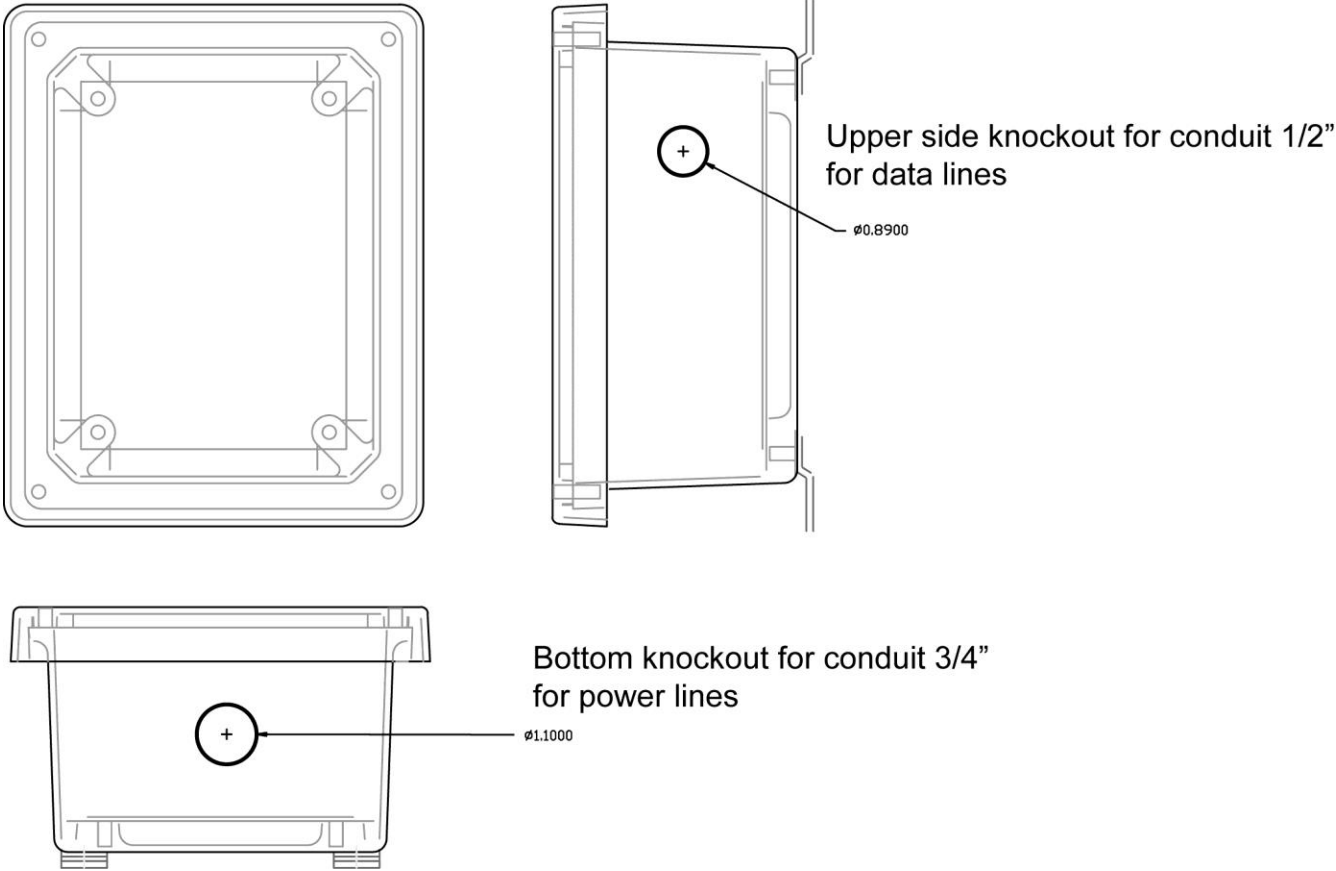


Fig 6 Recommended openings in enclosure for electrical and data lines

**4. Current Transformers**

PM 2106 should be used with following current transformers:

Part Number	Manufacturer
TC-141V, TC-150V, TC164H, TC172V, TC173V, TC174V, TC175V, TCT-140, TCT-142, TCT143, TCT-147, TZ-1, TZ-1-4, TZ-2, TZ-3, TZ-3.5, TZ-4, TZ-68, TZ-71, TZ-76, TZ-77, TZ-79L, TZ-105L	Tae Hwa Trans CO LTD 288-2 Misan-Dong Sihung-City Kyunggi-Do 429050, Korea
FCL	Flex Core Div. Morlan & Associates, Inc. 6625 McVey Blvd. Columbus, Ohio 43235

## 5. Safety Precautions.



Indicates the need to consult the operation manual due to the presents of potential risk



Indicates the presence of electrical shock hazards. Prior to proceeding, de-energize the circuit and consult the operation manual.

### **WARNING**

- Installation of electric meters requires working with possible hazardous voltages. These instructions are meant to be a supplement to aid trained, qualified professionals.
- Turn off all power supplying to the equipment before performing any wiring operations. Use a properly rated voltage sensing device to confirm power is off.
- Installation should be done in accordance with local codes and current National Electric Code requirements.

Failure to follow these warnings could result in serious injury.