

AEM31 PANEL

INSTRUCTIONS

1 SAFETY

This instrument was manufactured and tested in compliance with class 2 IEC 1010 and VDE 411 standards, in accordance with group B VDE 0110 standards for operating voltages up to 250 VACrms phase to neutral. It is suitable for use on 3 phase 4 wire (star) systems and single phase supplies. To maintain this condition and to ensure safe operation, the user must comply with the following instructions:


- Ensure that the operating voltage is correct for the supply.
- The power supply does not require an earth connection.
- A 50 mA T Type fuse should be installed in the power supply circuit to the instrument (i.e. phase 1).
- Maintenance and/or repairs must be carried out only by qualified, authorised personnel.
- If there is ever the suspicion that safe use is no longer possible, the instrument must be disconnected and precautions must be taken against accidental use;
- Operation is no longer safe when;
 - 1) If there is clearly visible damage
 - 2) If the instrument no longer functions
 - 3) after prolonged storage in unsuitable conditions;


1.1 OPERATOR SAFETY

Read these instructions carefully before installing and utilising the instrument.

The instrument described in this user manual is intended for use by properly trained staff only. Maintenance and/or repairs must be carried out by authorised personnel only. For proper, safe use of the instrument and for maintenance and/or repair, it is essential that the persons instructed to carry out these procedures follow normal safety precautions.

1.2 SYMBOLS

 **CAUTION:** Failure to follow the instructions may result in personal injury or damage to equipment.

 **NOTE:** Failure to follow the instructions may result in an instrument malfunction.

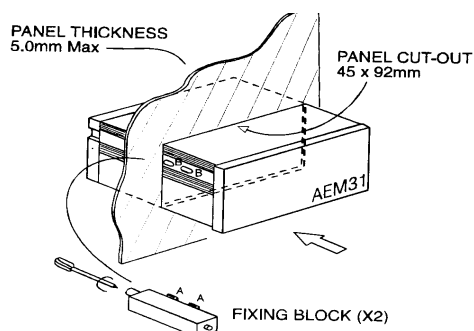
2 MOUNTING

The instrument is of the front mounting panel mount type conforming to the DIN 96x48 standard.

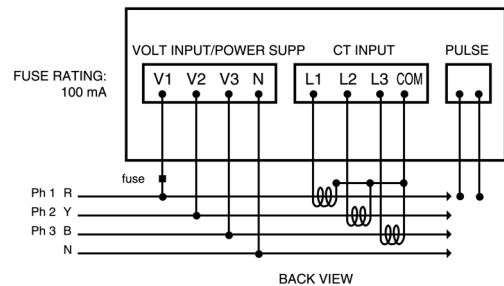
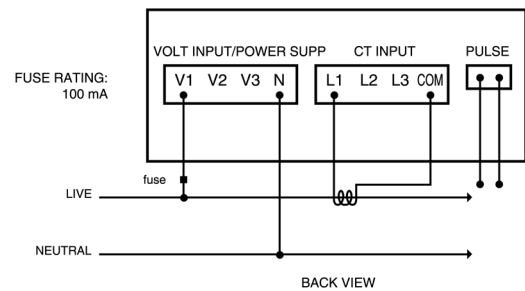
Panel Cut Out: 45mm x 92mm
Panel Thickness: 5mm Max

To mount the unit to the panel, push the unit through the cutout from the front. From behind the panel install the two mounting blocks by inserting the lugs AA into cutouts BB in the side of the instrument body and push backwards to lock into place. Ensure the crosshead screw is facing towards the back of the unit.


Using a suitable Phillips screwdriver tighten the mounting block screws down against the rear face of the front panel to hold the unit securely in place.



3.1 CONNECTION OF THE VOLTAGE INPUT



CAUTION: The instrument is suitable for connection to a 415VAC 4 wire STAR system. Connection is made via the terminals marked VOLTS INPUT. Phase 1 (RED) should be connected to V1, phase 2 (YELLOW) to V2 and phase 3 (BLUE) to V3. The Neutral (BLACK) cable is connected to the terminal marked N. For single phase systems voltage connections to V1 and Neutral only are required.

 **CAUTION:** The instrument has no internal power supply fusing and must therefore be protected by an external fuse rated at 250VAC 100mA Type T, fitted on phase 1 (RED).


3.2 CONNECTION OF THE CURRENT (CT) INPUT

The AEM31 is suitable for use with current transformers (CTs) with 5A secondary output. Metering quality CTs of Class 1 accuracy with a minimum rating of 2.5VA are recommended. See over for the table of CT ratios which can be utilised with this instrument.

Connection should be made according to the diagrams above. For 3 phase supplies one side of the CT secondaries (S1) should be connected to the relevant input terminal (Red phase to I1, Yellow to I2 and Blue to I3). The remaining CT Terminals (S2) are commoned to the COM terminal which should also be earthed as shown. For single phase systems connections to L1 and COM only are required.

NB: The AEM31 is an advanced design which automatically compensates for reversed CTs and incorrect phase rotation. However the relationship between current and voltage inputs must be respected (ie if red phase volts is connected to L1, the red phase CT must be connected to I1 etc).

3.3 PULSE OUTPUT CONNECTION

 **CAUTION:** The pulse output contacts are rated at 27VAC 20mA/ 27VDC 20 mA. Under no circumstances should this rating be exceeded.

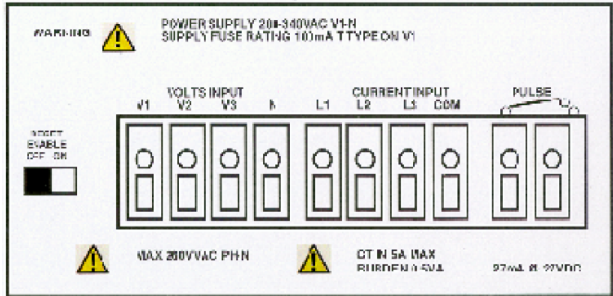
The pulse output connection is made via the two terminals marked 'pulse' (see below). The contacts are volt-free and therefore an external power source must be provided. Contacts are normally open, and provide an output of 1 pulse per kWh. Pulse duration (contacts closed) is 400/500 msec.

4.1 INSTRUMENT SET-UP AND RESET

When the instrument is correctly connected to voltage and current it will automatically power up and begin measuring. The display will show "WAIT" during initial power up whilst the unit carries out a self test routine. After a few seconds the display will show a value and the MD button will illuminate.

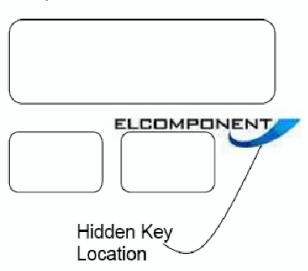
The instrument must be set up for the CTs to which it is connected. This need only be done once, after which the setting is maintained in memory for the life of the unit regardless of whether it is powered up or not.

NOTE: The "RESET" slide switch on the rear of the panel must be set to 'ON' prior to commencing the set-up routine



4.2 CT SET-UP

The unit utilises a hidden button situated in the centre of the AEM31 logo to the lower right of the front panel (see below). By depressing the 'MD' button and the kWh button simultaneously the instrument is entered into 'SET-UP' mode. Press the MD button to scroll the available CT ratios. When the desired ratio is displayed, press the 'hidden' button to accept the values into memory and exit set-up.



4.3 COUNTER/MD RESET

NOTE: The "RESET" slide switch on the rear panel must be set to 'ON' prior to executing a reset action.

To execute a reset of either the cumulative kWh counter value or the Maximum Demand value, ensure the value to be reset (kWh or MD) is displayed on the instrument.

Press the parameter key (kWh or MD) and the hidden key simultaneously to execute the reset.

NOTE: To eliminate the possibility of unwanted resets or set-up changes the RESET slide switch should always be set to 'OFF' after either of these actions have been carried out. This renders both set-up and reset inoperative.

5.1 INSTRUMENT OPERATION

Following connection and set-up the instrument may be set to read either kilowatt hour (kWh) consumption or Maximum Demand (MD) in kilowatts (kW).

Depress the kWh button to display kWh. The button will illuminate and the instrument will show the cumulative active energy consumption to two decimal places (1/100 of a kWh). Once the displayed value reaches 999999.99 the decimal will move one place to the right, allowing the AEM31 to measure up to 9999999.9 kWh to one decimal place.

Depress the MD button to display half hour maximum demand in kW. The button will illuminate and the instrument will show the highest average kW over a 30 min period since the last reset.

The display may be toggled between the two parameters without affecting the readings in any way.

6.1 TECHNICAL CHARACTERISTICS

Connection: 3 phase star or single phase
 Inputs: Voltage: 415VAC 3ph 50/60 Hz
 Current: 5A max 20/800 Hz Burden 0.5VA
 Pulse Output: Opto isolated volt free contact
 Rating - 27VAC 20mA/27VDC 20 mA
 Value - 1 pulse per kWh
 Duration - 400-500 msec
 Power Supply: Internally connected from volts input
 Consumption: 3VA
 Overload: Volts 264VAC Ph/N
 460VAC Ph/Ph
 Amps: 16A, Max 60A for 1 second.
 Weight: 300g.
 IP rating: Instrument = IP20 Front Panel = IP40
 Temp Range: From -5°C to +45°C
 Dims: 70w x 57.5d x 90h (mm)

N.B: Do not expose the instrument display to direct sunlight.

| SELECTABLE CT RATIOS | |
|----------------------|--------|
| 5/5 | 500/5 |
| 25/5 | 600/5 |
| 40/5 | 750/5 |
| 50/5 | 800/5 |
| 60/5 | 1000/5 |
| 75/5 | 1200/5 |
| 80/5 | 1250/5 |
| 100/5 | 1500/5 |
| 120/5 | 1600/5 |
| 150/5 | 1800/5 |
| 200/5 | 2000/5 |
| 250/5 | 2500/5 |
| 300/5 | 3200/5 |
| 320/5 | 4000/5 |
| 400/5 | |



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