DRANETZ BMI

# *K21-120*

## MULTIFUNCTIONAL ENERGY METER


USER'S GUIDE

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# WARNING

Death, serious injury, or fire hazard could result from improper connection of this instrument. Read and understand this guide before connecting this instrument. Follow all installation and operating instructions while using this instrument.

Connection of this instrument must be performed in compliance with the National Electrical Code (ANSI/NFPA 70-2008) of USA and any additional safety requirements applicable to your installation.

Installation, operation, and maintenance of this instrument must be performed by qualified personnel only. The National Electrical Code defines a qualified person as “one who has the skills and knowledge related to the construction and operation of the electrical equipment and installations, and who has received safety training on the hazards involved.”

Qualified personnel who work on or near exposed energized electrical conductors must follow applicable safety related work practices and procedures including appropriate personal protective equipment in compliance with the Standard for Electrical Safety Requirements for Employee Workplaces (ANSI/NFPA 70E-2004) of USA and any additional workplace safety requirements applicable to your installation.

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# 1 - PRECAUTIONS OF INSTALLATION AND USE

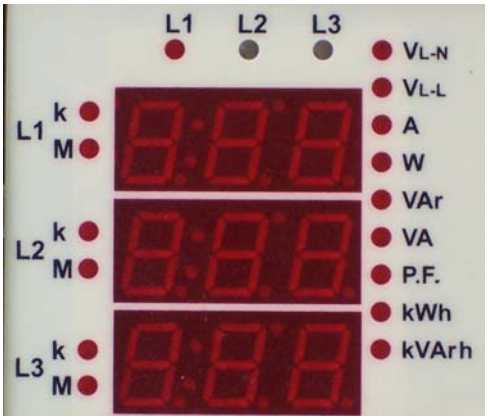
**NOT FOLLOWING THESE INSTRUCTIONS MAY CAUSE INJURIES OR DEATH!**

- Disconnect the power before starting to work on the equipment.
- When the instrument is connected to power supply do not remove the front panel.
- Do not clean the instrument with solvents. Use only dry cloth.
- Check the correct terminals in the cabling.
- The service of the instrument should only be performed by the supplier.
- The manufacturer and its subsidiaries do not assume responsibility for the consequences from the use of this equipment.
- The assembly should be only in panel.

## 2 - INSTRUCTIONS ON USE

The multifunctional energy meter K21 lets you monitor the electrical parameters of the network and view them in 5 displays. The parameters that can be displayed are:

- **Phase values**




Push the button to access to the desired parameter.

- **Totals values of Active Power (imported and exported), Apparent Power and Frequency**



Push the button to access to the desired parameter.

- **Totals values of Reactive Power (imported and exported) and cos φ (for imported and exported power)**



Push the button to access to the desired parameter.

- **Energy counters**
  The instrument provides 4 meters, Import and Export kWh (1L & 1C) and Import and Export kVArh (1I and 1E). The last 4 displays are used simultaneously display the 12 (4x3) counters.

- **Maximum, minimum and average values**

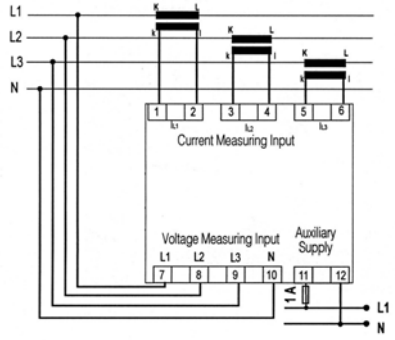
  Maximum value……
  Minimum value……..
  Average value……
  Instantaneous value,
  without illumination


Push the button to access to the desired parameter.

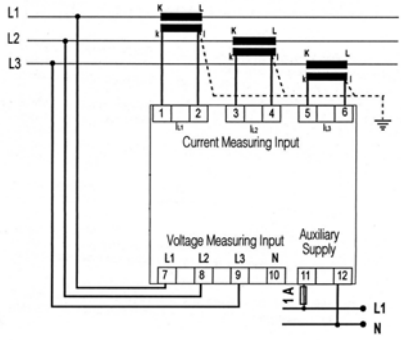
**NOTE!** The exported power is indicated with a blinking point so that inverted polarity problems in the installation can be detected easily.

# 3 – INSTALLATION

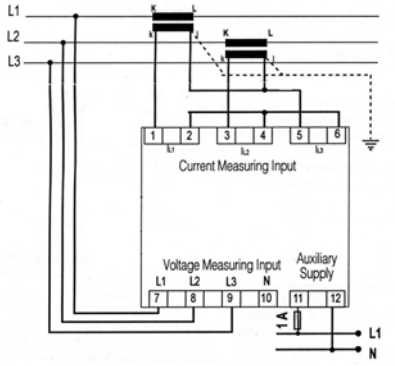
## Wiring Configurations for the electrical installation:



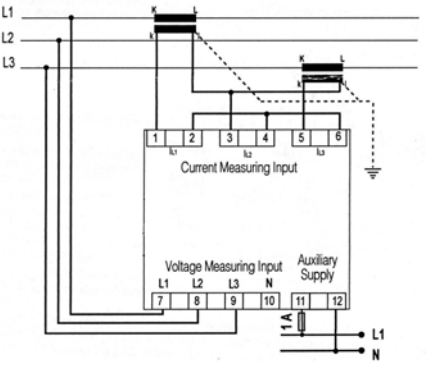

Three-phase four wires.




Three-phase three wires.



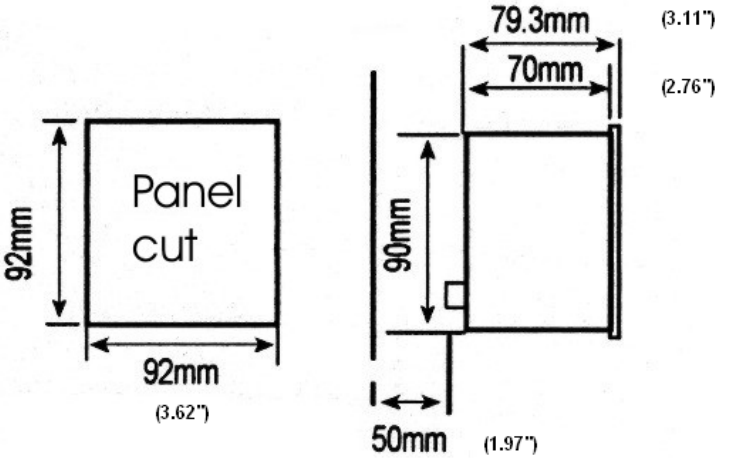

Open Delta, three-phase, three wires with connection on phases 1 and 2.




Open Delta, three-phase, three wires with connection on phases 1 and 3.

All these schemes are for balanced and not balanced system.

**Dimensions for the panel mounting:**




# 4 - CONFIGURATION

**The parameters that can be configured are:**

- Ratio current transformers
- Ratio voltage transformers
- Erasing maximum, minimum and counters
- Activation and change the password for access control

**Entry into the configuration menu**

Pressing the key ⏎ for 5 seconds, the options are: TRAFO, DETI, RESET, PIN; using the keys ▼ and ▲ to go up and down the menu (see scheme of the configuration menu).

It changes to each function by pressing the key ⏎. Use the keys ▼ and ▲ select the function and use the key ⏎ confirm.

**Exit configuration menu**

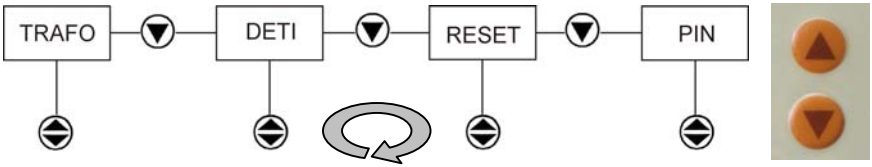
Pressing the key ◄ (ESC) until it shows “SAV, SET, YES”.

- If we press ◄ (ESC) or we choose “no”,

  **no recording made** of the new data.

- If we press ⏎ **it is recording** the new data.
- If no button is pushed in 30 seconds, the instrument exits configuration mode **without saving the changes**.

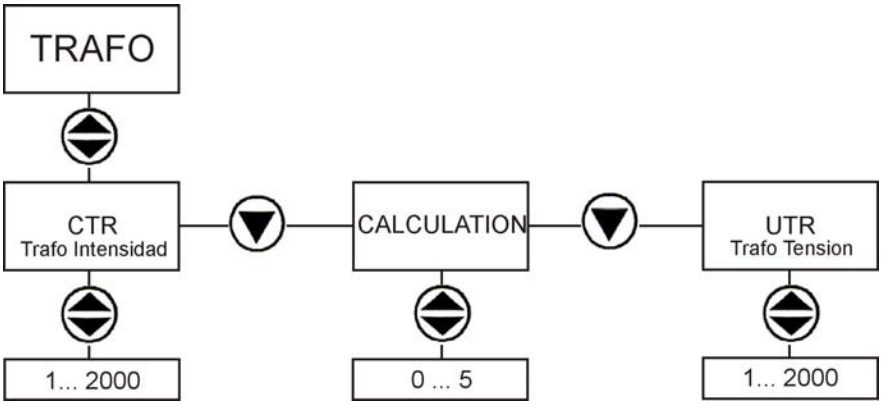
**Configuration menu**




Push the button to access the desired parameter

- **TRAFO:** Change transformer ratios.
- **DETI:** Adjustment of the demand interval.
- **RESET:** Reset of maximum, minimum and demand values.
- **PIN:** Access Key to prevent unwanted manipulations.

**TRAFO**: Change transformer ratios.




**(○)** **(□)** **(○)**

**(○)** You must enter the ratio and not the primary and secondary transformer value.

Example:

Transformer of 200/5 A ratio to introduce 40

Transformer of 34500/100 V → ratio to introduce 345.

If transformers are not used the ratio is 1

**(□)** Several calculation methods for reactive power, for internal adjustments. Default value is "1".

0 -Vectorial summation of 3 phase, 90° rotation of voltage vector and multiply with current.

1 -Each phase separately, 90° rotation of voltage vector and multiply with current.

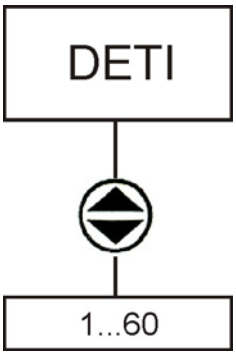
2 -Vectorial summation of 3 phase, $\Sigma V_n I_n \sin(\varphi_n)$

3 -Each phase separately, $\Sigma V_n I_n \sin(\varphi_n)$

4 -Vectorial summation of 3 phase, $\sqrt{s^2 - p^2}$

5 -Each phase separately, $\sqrt{s^2 - p^2}$

**DETI**: Adjustment of the integration time (demand interval).




**(◇)**

**(◇)** Integration time, in seconds, for the calculation of the demand values.

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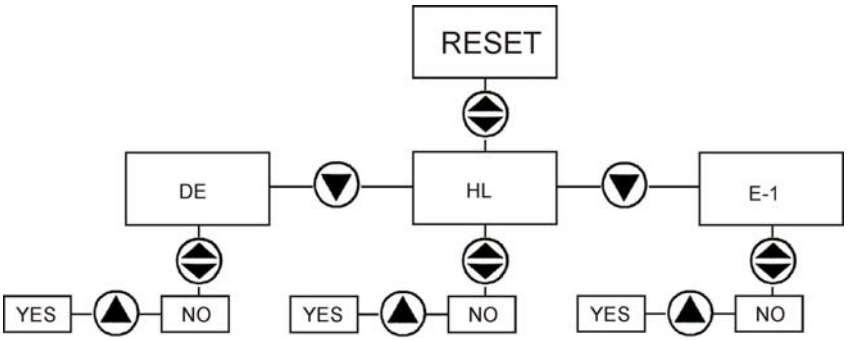
**RESET**: Reset of maximum and minimum values (HL), Demand values (DE), and counters (E-1).

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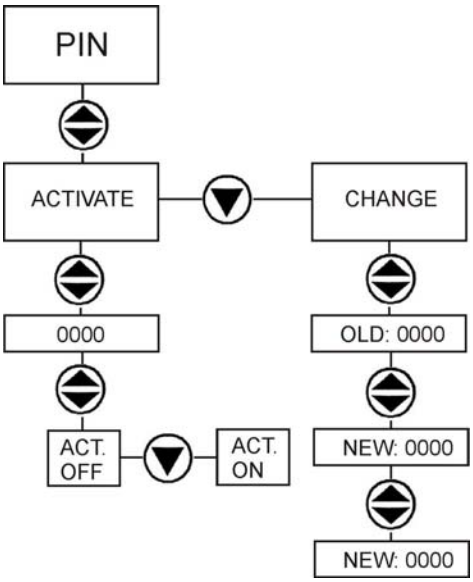
**PIN**: To enable and change the password.



# 5 - TECHNICAL DATA

| | |
|---|---|
| 4 quadrant measuring | True RMS |
| Input voltage | 10-300 V AC, 50-60 Hz (L-N)<br>10-500 V AC, 50-60 Hz (L-L) |
| Input current | 0.05 … 5.5 A |
| Aux. Power supply | 90-140 V AC, 50-60 Hz |
| Aux. Power supply power consumption | < 4 VA |
| Measuring input power consumption | < 1 VA |
| Class | 1 ±1 digit |
| Voltage Transformer Ratio | 1 … 2000 |
| Current Transformer Ratio | 1 … 2000 |
| Operating temperature | -5 °C … +50 °C<br>(23 to 122 °F) |
| Display | Red LED |
| Electric Protection | Double insulation – Class II |
| Box Protection | IP40, front panel |
| Box Material | Non flammable |
| Installation | Panel mounted |
| Installation Category | Class III |
| Wire Thickness (terminal block) | 2.5 $mm^2$ (11 gauge) |
| Dimensions | 96 x 96 x 80 mm<br>(3.8 x 3.8 x 3.1 in) |
| Weight | 0.45 kg (1 lb) |

## Statements and Notices

**Statement of warranty**
All products of Dranetz-BMI are warranted to the original purchaser against defective material and workmanship for a period of one year from the date of delivery. Dranetz-BMI will repair or replace, at its option, all defective equipment that is returned, freight prepaid, during the warranty period. There will be no charge for repair provided there is no evidence that the equipment has been mishandled or abused. This warranty shall not apply to any defects resulting from improper or inadequate maintenance, buyer-supplied hardware/software interfacing, unauthorized modification or misuse of the equipment, operation outside of environmental specifications, or improper site preparation or maintenance.

**Statement of reliability**
The information in this guide has been reviewed and is believed to be entirely reliable, however, no responsibility is assumed for any inaccuracies. All material is for informational purposes only and is subject to change without prior notice.

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