CVM-NRG96 is an instrument that measures, calculates and displays the main electrical parameters in three-phase industrial power grids (balanced or unbalanced). The measurement is taken as an RMS value by three AC voltage inputs and three AC current inputs. (through current transformers, \( I_p / I_A = 1 \)). The measured and calculated parameters are shown in the table of variables.

This document provides the instructions for use and describes the operation of the CVM-NRG96 analyzer. You can download the manual from CIRCUTOR’s web site in case it is misplaced: www.circuitor.com

You must disconnect the unit from all power supplies before performing any maintenance operations, connect the unit to its protection system, remove the unit from service. The design of the unit makes it easy to replace in the event of a fault.

1.- SETUP - Metering

To enter the metering setup menu, press the \( R \) and \( E \) keys for 5 seconds.

The \( R \) key validates the data and skips to the next menu. The \( E \) key can be used to select the different options in the menu or to raise one digit if a variable is being entered.

The \( E \) key is used to move the cursor between digits. The various options are described below in sequence.

1.1.- Voltage phase-phase or phase-neutral

This option allows to display the voltage phase to phase or phase to neutral in the device:

- b) \( SEI \) or \( SNI \): voltage phase to neutral
- b) \( SEI \) or \( SNI \): voltage phase to phase

1.2.- Primary winding of the voltage transformer

1.3.- Secondary winding of the voltage transformer

1.4.- Primary winding of the current transformer

1.5.- Secondary winding of the current transformer (ver. .../SA /..1A)

1.6.- Programming the maximeter:

1.7.- Initial start screen programming

1.8.- Initial start energy selection

VARIABLES AND ALARM CODES

If no variable is to be programmed, select \( 00 \)

The analyzer has variables that refer to the three phases simultaneously. If these variables are selected, the unit makes an OR type logical function, activating the alarm flag when any of the three phases meets the triggering conditions.

2.- SETUP - Communication

To enter the communication menu of the unit, press the \( R \) key and then press \( REV \) and \( F \) for 5 seconds until you enter the communication setup.

The configuration parameters for the device are:

- \( SET PRO: \) 80C (BacNet)
- \( SET DEF: \) (standard), \( * \) (default configuration)
- \( SET RMC: \) peripheral no. \( 001 \) to \( 255 \)
- \( SET BRD: \) (speed): 9.6-18-38-4.8-115.2
- \( SET ID: \) (Device_ID)
- \( SET LOC: \) (unlocked), \( LOC \) (locked)

*Default configuration: 002 / 3800

2.1.- SETUP - locking or unlocking

By choosing the \( LOC \) option, on entering metering SETUP, it is only possible to see the programming, no parameter can be changed. When the \( LOC \) option is activated, the password 1234 must be entered to edit the programming of the unit.

METERING IN FOUR QUADRANTS
3.- CVM-NRG96 communication

The unit incorporates BACNet MS/TP communication, following the specifications of ANSI/ASHRAE 135 (ISO 16484-5). Using a RS485 connection, the analyzer can connect to a BACnet and include all of the objects and services defined in the attached PICS map (Protocol Implementation Conformance Statement). Instant, maximum and NRG96mum variables can be read.

The default speed is 38400 bps and the MAC is 2 (node number), and can be changed with the keyboard or by writing the BaudRate and MAC_Address variables. The identifier (Device_ID) can be changed with the keyboard, with write property or by writing the Device_ID variable. Another option is to write on the Object_Name in Device:

a) #Baud x – where x may be: 9600, 19200, 38400, 57600, 76800, 115200 bps
b) #MAC x – where x may be: 1 ... 255
c) #ID x – where x may be: 1 ... 4194303

For further information on the protocol www.bacnet.org.

4.- TECHNICAL FEATURES

### Power circuit:
- Voltage tolerance: -15...10%
- Frequency: 50 - 60 Hz
- Maximum consumption: 1.8 ... 3.6 VA
- Working temperature: -10 ... + 50 °C
- Humidity (no condensation): 5 ... 95%
- Altitude: 2000 m

### Mechanical features:
- Case material: Self extinguishing V0 plastic
- Protection: Fitted unit (frontal): IP 51
- Non-fitted unit (sides and rear cover): IP 31
- Dimensions (mm): 96 x 96 x 63
- Weight: 400 g

### Accuracy class:
- Voltage: 0.5 % ± 2 digits
- Current: 0.5 % ± 2 digits
- Powers: 1 % ± 2 digits

### Measurement conditions:
- Voltage: Direct or indirect measurement with transformer
- Current: Indirect measurement by means of transformer
- Power Factor: 0.5 to 1
- Scale range measurement margin: ITF / Shunt 0.2 ... 120% / 2 ... 120%

### Metering circuit:
- Frequency: 45 ~ 65 Hz
- Minimum current: 50mA
- Nominal current: L1/5A or 1A
- Permanent overload: 1.11 h
- Voltage input consumption: 0.7 VA
- Current input consumption: ITF / Shunt: 0.9 VA / 0.75 VA

### Features of the output transistors:
- Type: Opto-isolated transistor (open collector)NPN
- Maximum switching voltage: 24 V d.c.
- Maximum switching current: 50 mA
- Maximum frequency: 5 pulses / second
- Impulse duration: 100 ms

### Safety:
Installation category III / EN61010. Double-insulated electric shock protection class II. The equipment must be connected to a power circuit protected with type gl fuses, in compliance with IEC 269, or type M, with values from 0.5 to 1A. It must be fitted with a circuit breaker switch or an equivalent device, in order to be able to disconnect the equipment from the power supply grid. The NRG96mum diameter of the power supply cable shall be 1mm².

### Standards:
IEC 664, VDE 0110, UL 94, IEC 801, IEC 348, IEC 571-1, EN 61000-6-3, EN 61000-6-1, EN 61000-4-11, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-5-2, EN 61000-5-3, EN 55011

5.- CONNECTIONS

### 4 wires / 3 wires (low voltage)

### 3 wires (2 voltage and 3 current transformers)

### 3 wires (2 voltage and 2 current transformers)

6.- TECHNICAL SERVICE

If you have any doubts about the operation of the unit or suspect any malfunction, contact our service staff at CIRCUTOR, SA

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