EDM2K PREPAID THREE-PHASE METER

The prepaid three-phase electronic meter, **EDM2*k*** is an instrument capable of measuring active energy in two tariffs; these meters have a digital output operating a breaking device (overload/earth leakage device with trip coil) when the balance is zero, and a digital input to operate the tariff in which the meter is working (Tariff 1 or 2). The meter is equipped with a built in communications input with data encryption (TTL), ideal for connecting local card readers (LPP), which perform the monetary recharge action and therefore the recharging of associated kilowatts/time.

This manual is a quick guide to the use and operation of the **EDM2*k*** energy meter. An electronic version of this manual may be seen on **CIRCUTOR's** website: www.circutor.es

⚠ Before any maintenance operation, connection modification, repair, etc., the instrument must be disconnected from power supply. If any operation or protection fault is suspected the instrument must remain out of service ensuring against any accidental reconnection. The instrument is designed to be changed quickly in the event of any breakdown.

1.- DISPLAY

The EDM2k meter continuously displays energy accumulated in Tariff 1 together with the remaining balance up to when power is cut. The balance decreases as the preset price ratio. In addition to the meter displaying Tariff 1, it also has a second screen to display total energy in Tariff 2 and the money balance in the meter.
Money recharging is unique for both tariffs. The user just has to enter the amount of money and the meter deducts the balance by applying one or more ratios depending on the tariff (Tariff 1 or Tariff2).

2.- KEYPAD FUNCTIONS

The button allows movement between different energy group tariffs: by repeatedly pressing the instrument displays accumulated energy for Tariff 1 and Tariff 2 successively; regardless of the tariff which is being consumed at the time (the tariff in which the meter is measuring is shown on the bottom lime of the display).

The button accesses the price per consumed kilowatt/time display for each tariff. If the user is already in this display, this button is pressed again to access the standard energy display. The set up menu is used to increase a digit by 1 or to enter or select a variable.

The button only remains active in the price display. The repeated use of this button allows the meter to display the price used for kW·h in Tariff 1 and Tariff 2. This button is used to move the cursor among the digits in the set up menu.

The Setup button acts as rapid access to the full parameterization menu for the instrument. The button has to be pressed for less than one second to access this menu.

The Set A button is a one step start up button for the meter, with minimum meter setting. (*See section* One step parameterization).

The Clear button has no function on this prepaid meter model.

The Display button has no function on this prepaid meter model.

3.- STARTING-UP JUST IN ONE STEP

3.1.- Preset information

This option is only valid for installations where there is no voltage transformer for measurement; this voltage measurement is direct (300V AC$_{f\text{-}n}$ / 500V AC$_{f\text{-}f}$); and current measurement is via one or five ampere external current transformers with secondary.

3.2.- One step parameterization

Pressing the Set A button for about one second enables the primary and secondary current transformer parameterization screen.

Using the and buttons current transformer primary and secondary are parameterised and entered using the button.

4.- COMPLETE METER PARAMETERIZATION

All setting options may be fully parameterised in the meter. The options affect the external voltage and current transformers, if any, and the pre-alarm level associated with the COM LED (*% compared to last load*).

4.1.- Voltage transformer primary

"PriU" appears on screen followed by 7 digits. These allow the voltage transformer primary to be set (from 1 to 999.999).

4.2.- Voltage transformer secondary

"SECu" appears on screen followed by 3 digits. These allow the voltage transformer secondary to be set (from 1 to 999).

4.3.- Current transformer primary

"PriA" appears on screen followed by 5 digits. These allow the current transformer primary to be set (from 1 to 9.999).

4.4.- Current transformer secondary

"SEcA" appears on screen followed by the number 5 or 1. These allow the installed current transformer secondary ratio to be set (5= …/ 5A or 1= …/ 1A).

4.5.- Setting the "backlight" disconnection time

"diSP oFF" appears on screen; the time in seconds of the backlighting after the last press of any button must be set. The backlight is permanently on if 00 is set.

4.6.- Pre-alarm value

The instrument has a pre-alarm display to show if the available money balance is low and therefore the requirement to recharge the EDM2k meter. The pre-alarm display uses the COM LED by flashing rapidly: 2 pulses per second. Parameterization is the value in watts.

5.- DEFAULT SETTINGS

The EDM2k electronic three-phase meter is supplied with the following default settings:

VARIABLE	SECTION	VALUE
Voltage primary	4.1.-	000001
Voltage secondary	4.2.-	001
Current primary	4.3.-	0005
Current secondary	4.4.-	5
Backlight disconnection	4.5.-	10
Backlight disconnection	4.6.-	10

6.- TARIFFS (EDM2K TYPE)

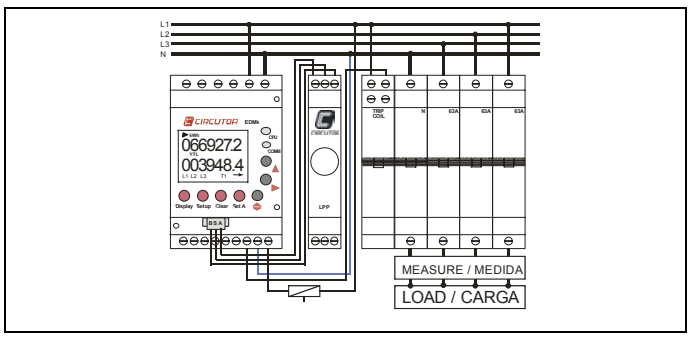
The tariff time is carried out using hardware. The instrument has a common (which must be permanently connected to the installation's neutral), and an input to select the type of tariff in which it is to operate: Tariff 1, or Tariff 2 (this input must be connected to a phase in the installation and must operate with a relay or contactor (See section *Technical features* on the tariff display input for connection).

- Tariff 1: Opening of voltage of phase (Terminal 9).
- Tariff 2: Connection of voltage of phase (Terminal 9).

Each tariff has a price depending on the type of connection (system or generator), or the time slot where the user is consuming. These prices are shown on the display (see section 2.-).

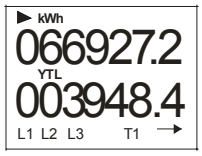
7.- DEVICE CONNECTION DIAGRAM

The EDM2k prepaid system physically comprises four elements: the metering system has a local card reader (LPP), which reads the internally recorded balance, energy cost in Tariff 1 and energy cost in Tariff 2.
Energy costs may be unique and exclusively changed the main user in charge of reading and distributing cards. Costs can in no way be changed by the meter's end user.
Another device is the undervoltage coil (TeleL – GE), which, after the meter has used up all of the balance, receives a pulse and mechanically drops the installation's overload/earth leakage device or breaking device without any option for manually rearming.
The associated overload/earth leakage device may be for two or wire systems according to the application (single-phase or three-phase system); the system is designed to operate with CIRCUTOR brand overload/earth leakage devices, or if not GE approved devices.



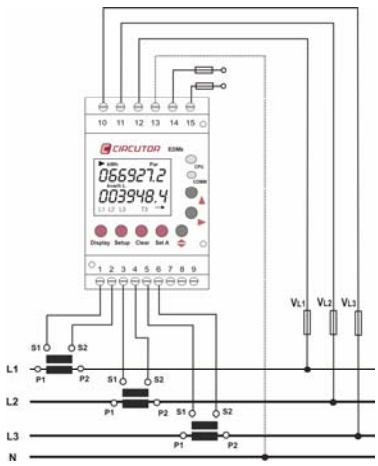
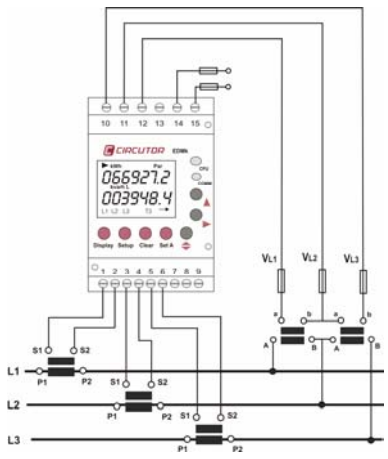
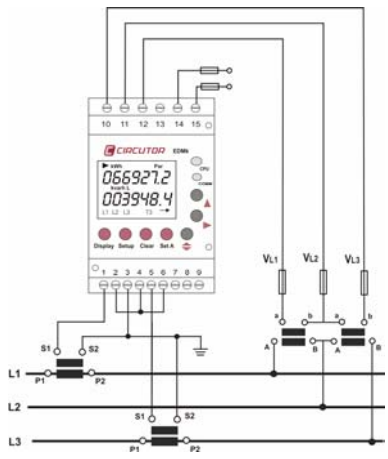
8.- DISPLAY

The **EDM2*k*** energy meter display is divided into two areas: the first (on the upper section) displays the accumulated value in active energy meters in Tariff 1 and Tariff 2. Secondly, the balance available up to when the power is cut off is displayed (digital output operation).



- `L1-L2-L3` shows that the instrument has measured voltage in each of the three-phases; if there is voltage measured in one phase, the indicator disappears for that phase. Negative symbols appearing after each phase (L), shows the current direction in the current transformers, informing if energy is being consumed or generated at the point of measurement (*informs of possible errors of connection in current transformers*).
- `T1 T2` displays the tariff selectable at that time, regardless of the tariff displayed on the upper section.
- The symbol indicates if the load is inductive; the symbol indicates that the load is capacitive.
- The symbol indicates that the meter is located in the first and fourth quadrant (consumption); the symbol indicates that the meter is in the second and third quadrant (generation).

9.- CONNECTIONS

4 wire / 3 wire (low voltage)	3 wire (2 voltage transformers and 3 current transformers)	3 wire (2 voltage transformers and 2 current transformers)
		

10.- TECHNICAL FEATURES

Power supply circuit :	AC. Type	AC. and DC. Type
- Single-phase :	230 VAC.	85..265V AC. / 95..300V DC.
- Voltage tolerance :	-15 % / +10 %	
- Frequency :	45...65 Hz	0...65 Hz
- Maximum burden - Operating temperature :	5 VA	5 VA
- Humidity (without condensation) :	-20ºC .....+ 60ºC	-20ºC .....+ 60 º C
	5% 95%	5% 95%
Mechanical features:		
- Casing material:	Self extinguishing V0 plastic	
- Assembled unit protection (front):	IP 51	
- Non assembled unit protection (sides and rear cover):	IP 31	
- Dimensions (mm):	85 x 52 x 70 mm (3 step)	
- Weight:	0.210 kg	
- Accuracy class on Active Energy:	Class 1 – EN62053-21	
- Accuracy class on Power Factor:	Class 2 – EN62053-23	

Measurement circuit:	
- Rated voltage:	300V AC. $_{f\text{-}n}$ / 500V AC. $_{f\text{-}f}$
- Frequency:	45…65 Hz
- Rated current:	…/ 5A or …/ 1A
- Permanent overload:	1.2 In
- Voltage circuit burden per phase:	0.3 VA
- Current circuit burden per phase:	0.3 VA to 5A and 0.06 to 1A
Pulse output transistors features:	
- Type: opto-insulated transistor (open collector):	NPN
- Maximum operating voltage:	24 V DC.
- Maximum operating current:	50 mA
- Maximum frequency:	5 pulses / second
- Pulse length:	50 ms
Standards: EN62052-11, EN62053-21, EN62053-23, EN61010-1 Safety: Category III / EN-61010-1 Protection against electric shock by class II double insulation	

11.- TECHNICAL SERVICE

For any question regarding the equipment's operation or in the event of malfunction, please contact the technical department at CIRCUTOR, SA.

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