



**3 PHASE ENERGY ELECTRONIC
METERS**

MKB-363-M

INSTRUCTION MANUAL

(M 981 198 / 00 B)

(c) CIRCUTOR S.A.

THREE-PHASE THREE-WIRE ACTIVE ENERGY ELECTRONIC METERS TYPE: MKB-363-M

1.- BASIC INSTRUCTIONS

1.1.- Delivery spot check

This manual is issued to help all the ENERGY METERS users to install and use them in order to get the best from them. After receiving the unit please check the following points:

- (a) Does this device correspond to your order specifications?
- (b) Check if any damage was done during the shipment process.
- (c) Verify that includes: one instruction manual.



1.2.- Safety considerations

This manual contains information and warnings that must be followed for operating the ENERGY METER safely and maintaining the instrument in a safe operating condition.

2.- MAIN CHARACTERISTICS

Three-phase electronic energy meters for low voltage networks at **230 V a.c. (code 771 053) or 400 V a.c. (code 771 054)** , provided with mechanical rotatory display, which are designed to measure the active energy consumed by a three-phase **three-wire loads** Those are suitable for such installations where a partial energy consumption analysis is required.

Direct connection for the voltage signal (3 x 230 V a.c.) or (3 x 400 V a.c.) and current through current transformers inside phases L1 and L3.

Available models:

- Meter type **MKB-363M:**

Three-phase three-wire active energy meter single tariff with build-in current transformers. Display by means of an electromechanical integrating meter in kW·h.

Basic Features:

- Active energy computation algorithm uses Aron connection principle, so phases L1 and L3 include current transformers and L2 is the voltage reference phase. This allows to use this active energy meter in any three-phase three-wire system without neutral or earth currents.
- All energy meters operate over two quadrants: **consumed power**.
- Current transformer (only phases L1 and L3):
 - nominal current : 63 A
 - maximum current : 90 A
- Electrical accuracy : Class 2
- All energy meters have two pulse outputs: one for the kW·h consumed and the other with a timer. The energy output permits a remote transmission of the measurement of the kW·h consumed to a PLC or an energy meter centralisation unit like CIRCUTOR LM24. The timer output allows to compute the average active power for 15' periods.

Pulses:

- Optocoupled outputs (2500 V respect to the electric network)
- Open collector type: 100 ms of duration
max. ratings 35 Vdc/30 mA
both outputs share the same common

Energy output

- Energy ratio : 100 pulses/kW·h

Timer output

- Timer ratio : 4 pulses/h

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- The meter has two LED's at its frontal cover:
 - a **green LED** of POWER, which indicates that the meter is connected to the supply
 - a **red LED** for the metrology control and the energy flow visualisation (it blinks only with consumed power).

Such led blinks each 10 W·h.

3.- INSTALLATION AND START-UP



The manual you hold in your hands contains information and warnings that the user should respect in order to guarantee a proper operation of all the instrument functions and keep its safety conditions. The instrument must not be powered and used until its definitive assembly on the cabinet's door.

Whether the instrument is not used as manufacturer's specifications, the protection of the instrument can be damaged.

When any protection failure is suspected to exist (for example, it presents external visible damages), the instrument must be immediately powered off. In this case contact a qualified service representative.

3.1.- Installation

- (a) Power supply is taken from own phases L1-L3 :
at 230 V ac $\pm 20\%$ (**code 771 053**)
or at 400 V ac (**code 771 054**)



see MKB-363-M voltage power supply !

- (b) Current input of 63 A ac (maximum current 90 A ac)
Build-in current transformer (only phases L1 and L3)
- (c) Frequency : 45..65 Hz
- (d) Instrument burden : 2 W / 4 VA
- (e) Operation conditions:
Designed for inner uses according to EN-61036
- Operating temperature : -10 °C/ +45 °C
 - Humidity : 25 to 75% R.H. non-condensing
- (f) Safety :
Designed to meet protection class II as per EN 61010

Mounting:

Instrument is to be mounted onto a DIN rail. All connections keep inside the cabinet.

Note that with the instrument powered on, the terminals could be dangerous to touching and cover opening actions or elements removal may allow accessing dangerous parts. Therefore, the instrument must not be used until this is completely installed.

The circuit must be provided with an automatic switch to disconnect it from the power supply network and an earth leakage switch to guarantee its proper operation. The active phases L1 and L3 will be both connected through a wire with a minimum cross-section of 50 mm², while the reference phase L2 needs a minimum cross-section of 1 mm².

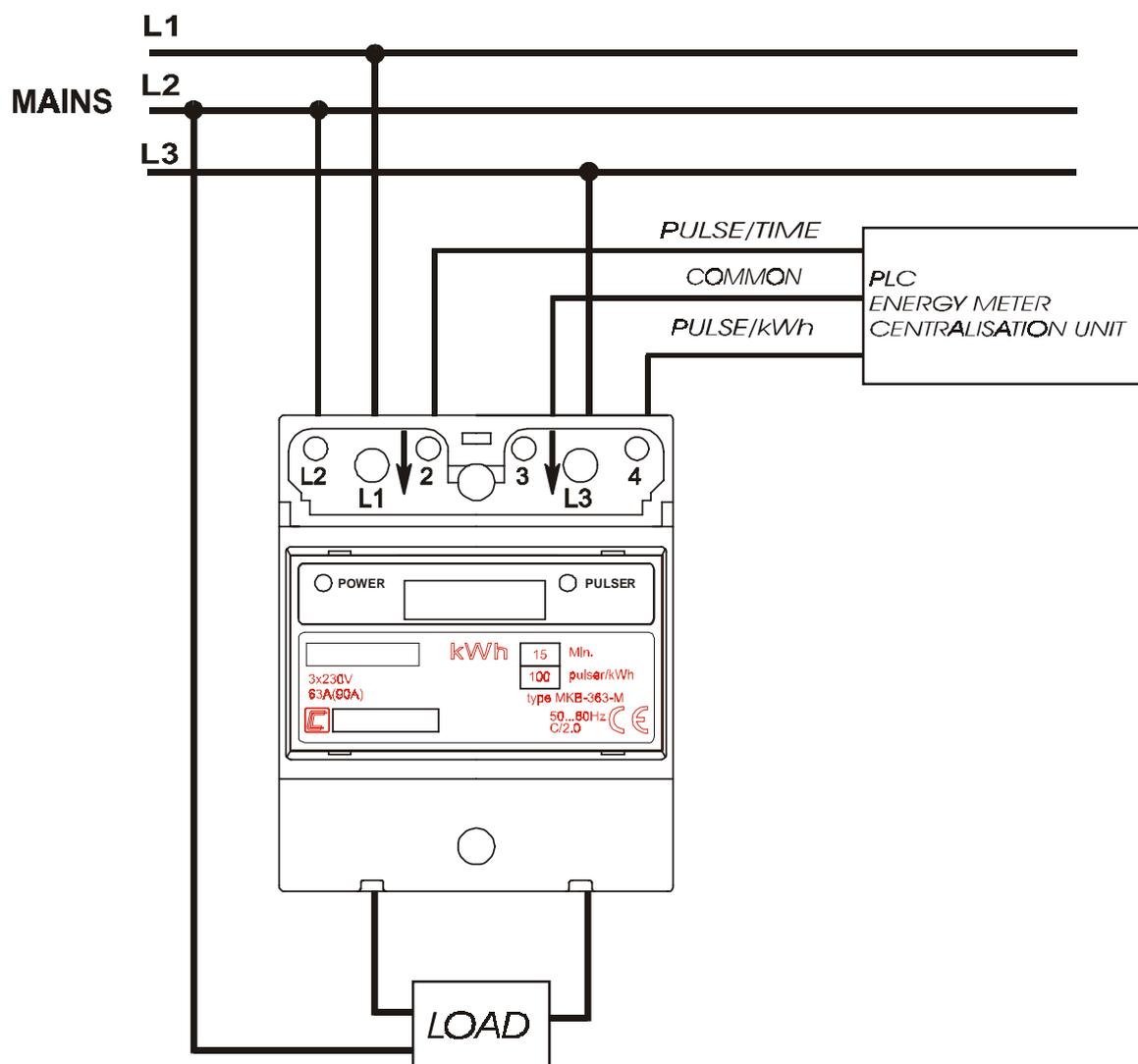
3.2.- Energy meter set-up and calibration

This energy meter needs no calibration nor set-up.

3.3.- Energy meter connection terminal

<i>Terminal NR</i>	<i>Designation</i>	<i>Concept</i>
L1	voltage input current input	Phase 1
L3	voltage input current input	Phase 3
L2	voltage input	Phase 2 (reference phase)
2	+	timer pulse output (optocoupled)
3	common	
4	+	energy pulse output (optocoupled)

3.4.- Connection drawing of the three-phase energy meter in a three-phase three-wire low voltage mains



4.- TECHNICAL CHARACTERISTICS

VOLTAGE CIRCUIT

- Rated voltage 230 V \pm 20% or 400 V \pm 20%
 - Supply voltage
 - code 771 053** - 230 V \pm 20% (between phases L1-L3)
 - code 771 054** - 400 V \pm 20% (between phases L1-L3)
 - Frequency 45 .. 65 Hz
 - Consumption 2,0 W
 4,0 VA
-

CURRENT CIRCUIT

(only phases L1 and L3)

- Rated current 63 A (base current - I_n)
 - Maximum current 90 A
 - Start current 0,4% I_n
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DISPLAY MODE

-Type	Mechanical rotative (without reset)
- Display	6 +1 digits
- Energy unit	kW·h
- Resolution	100 W·h
- Maximum count	999999,9 kW·h

PULSE OUTPUTS:

- N° outputs	2
- Output type	By opto-isolated transistor (open collector)
- Timer output	4 pulses/h (opto-isolated)
- Energy output	100 pulses/kW·h (opto-isolated)
- Pulse duration	100 ms
- Maximum collector current	30 mA
- Maximum collector-emitter voltage	35 V
- Isolation voltage	2500 V

CONSTRUCTIVE CHARACTERISTICS:

Casing type	Modular DIN rail
Protection class	IP-20
Cable input	max. \varnothing 11 mm
Dimensions	(see next fig.)
Weight	300 g
- Temperature	inner use -10°C / +45°C refer to §4.3.1 EN-61036
- Humidity	(non-condensing) <75%

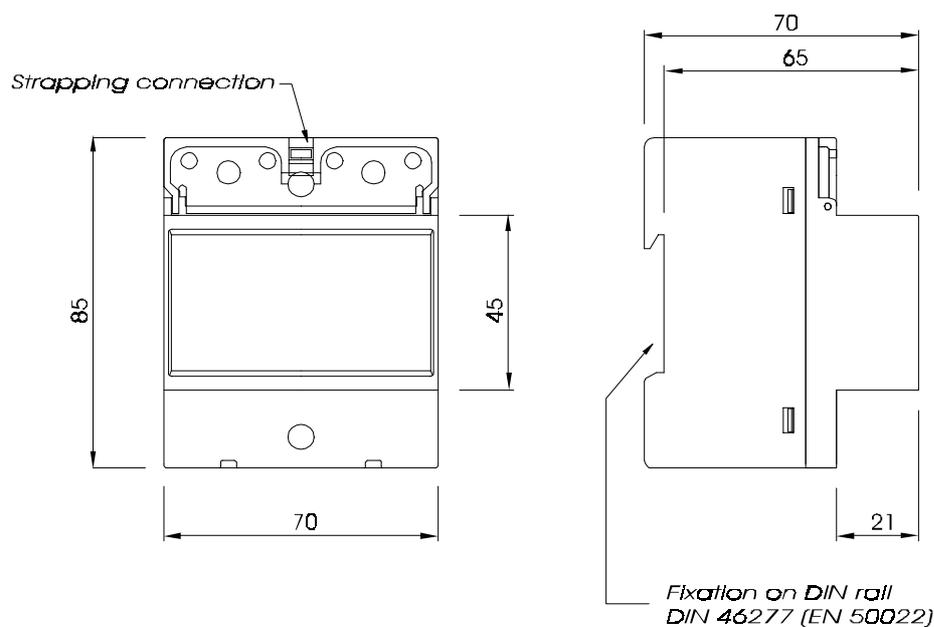
GENERAL SPECIFICATIONS

(according to EN-61036 and IEC-1036 standards for **three-phase energy meters - class 2**)

Typical accuracy	at maximum current	0,8 %
	at rated current (I_n)	0,8 %
	at 5% I_n	1,4 %

- STANDARDS: IEC-1036, EN-61036, EN-61010

DIMENSIONS:



5.- SAFETY CONSIDERATIONS

All installation specification described in this manual must be carefully observed by the user.

Note that with the instrument powered on, the terminals could be dangerous to touching and cover opening actions or elements removal may allow accessing dangerous parts. This instrument is factory-shipped at proper operation condition.

6.- MAINTENANCE

The MKB-363M does not require any special maintenance. No adjustment, maintenance or repairing action should be done over the instrument open and powered and, should those actions be essential, high-qualified operators must perform them.

Before any adjustment, replacement, maintenance or repairing action is carried out, the instrument must be disconnected from any power supply source.

When any protection failure is suspected to exist, the instrument must be immediately put out of service.

7.- TECHNICAL SERVICE

For any inquiry about the instrument performance or whether any failure happens, contact to CIRCUTOR's technical service.

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