Department of consumer and corporate affairs / Ministère de la consommation et des corporations

STANDARDS BRANCH - DIRECTION DES NORMES

NOTICE OF APPROVAL
AVIS D'APPROBATION

E-112-1

OTTAWA August 29, 1974

LANDIS & GYR TYPE ZFR1--- 2-ELEMENT, AND TYPE ZMR1---
3-ELEMENT ELECTRONIC WATTHOUR METER

Rated Voltage	115-120 volts
Current Range	0.12-10 A
Frequency	60 Hz
Register	6 digit cyclometer, with test dial, stepping motor driven
Auxilliary Power Supply	120v, 60Hz, 9W
Element Consumption Current and Voltage	0.1 VA per element
Approved Options	.1 Single Register .2 Dual (Import & Export) Register with Indicator Lights r13 SPDT 3-wire transmitting contact r14 SPDT 2-wire transmitting contact (use N.O. side only)

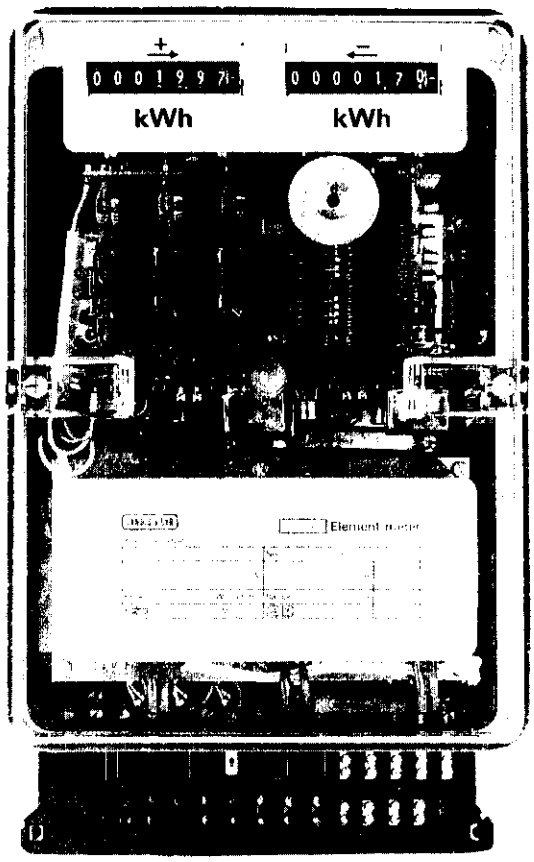
For both r13 and r14 contact loading is 250V, 0.5A, ac or dc.

This is a revision (re-issue) of Notice of Approval E 112, July 12, 1974, which is superseded.

Description

The approved meters use the mark space amplitude (MSA) multiplication principle to effect measurement of electrical energy. Each current and voltage input feeds an internal transformer which supplies the inputs to each MSA multiplier. These transformers provide complete isolation.

Within the MSA module a crystal controlled multivibrator produces a square wave which is acted upon by the secondaries of the internal transformers in such a way that the current applied affects the amplitude of the square wave and the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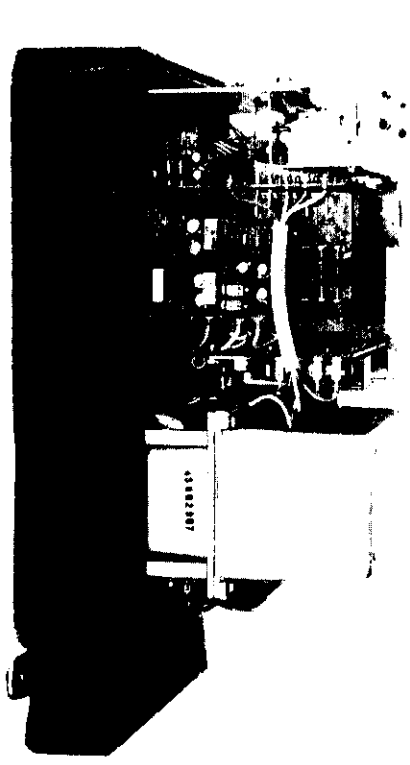

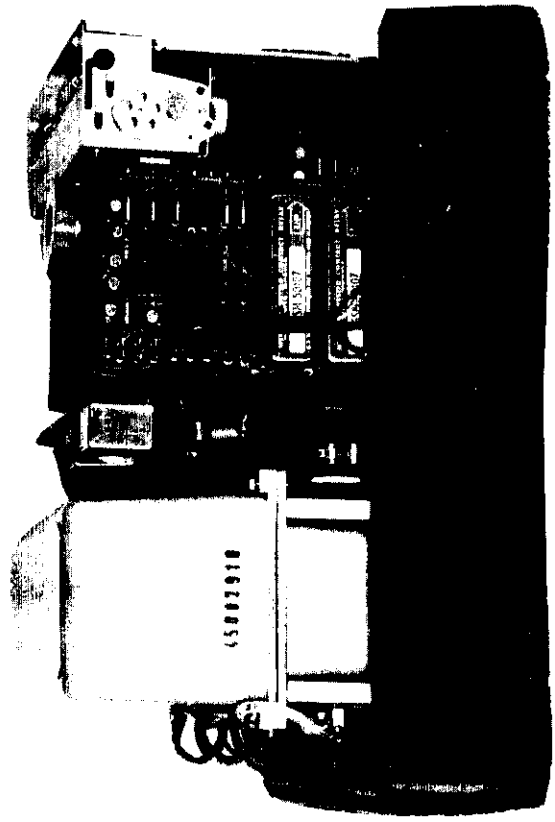

voltage applied changes the relative durations of the positive and negative going portions of each cycle.

This modulated square wave is amplified, rectified and filtered so as to produce a dc signal which is proportional to the power applied to each element.

The dc signals from all elements are summed and the resultant is applied to a dc to frequency convertor circuit. The convertor output is a frequency which is proportional to the applied power. An electronic starting lock, connected after the convertor, prevents the output of pulses at loads less than 0.1% of nominal.

If sufficiently high, this frequency is then applied to the LED test light mounted on the front of the meter in a magnetic housing. Counting the flashes of this test light gives an indication of the energy seen by the meter in exactly the same manner as counting the disc revolutions of an induction type watthour meter does. Under most load conditions the LED flashes at a rate such that the flashes are indistinct. This necessitates the use of a light sensitive pick-up and an electronic counter. The term "test constant" (Kf) has been adopted and is defined as the watthours per flash of the test light. It is exactly analogous to the disc constant of an induction watthour meter.

As well as being applied to the LED, the output frequency of the dc frequency convertor is also fed to a logic circuit, then through frequency reducers, and hence to either the import or export register and transmitting contact.

The Ki (watthours per impulse) of these transmitting contacts is affected by the frequency reducers, the multi-vibrator frequency of the MSA modules and the trimming within these modules. These last two also affect the test constant (Kf).

For this reason it is not possible to specify a Kf as is done with induction meters. This makes it possible for the manufacturer to offer a wide range of pulse constants to suit the customer's needs.

For verification purposes, the Kf and Ki stamped on the nameplate will be used. Verification instructions will be issued at a later date.

These meters have no adjustments.

Approval granted to:

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