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-134

OTTAWA July 7,, 1975

LANDIS & GYR TYPE "FL 347" - 2-ELEMENT, AND TYPE "ML 347" - 3-ELEMENT POLYPHASE WATTHOUR METERS

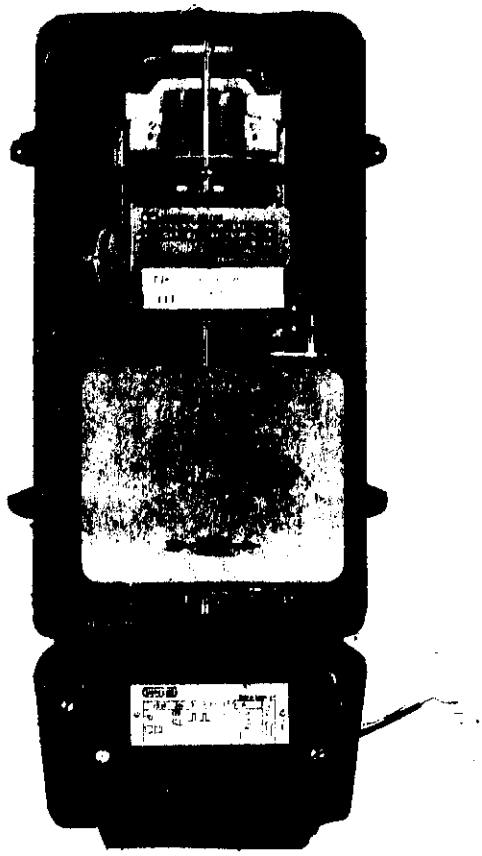
Voltage	115-120 volts and 230-240 volts
Current Range	0.12 - 10 amperes
Frequency	60 Hz
Watthour Constant	0.8 Wh/rev for "FL 347",1.2 Wh/rev for "ML 347"
Registrer Ratio	166 2/3 for "FL 347" and 111 1/9 for "ML 347"
Register	5-Dial clock with test dial.
Auxiliary Power Supply	115-120 volts, 60 Hz

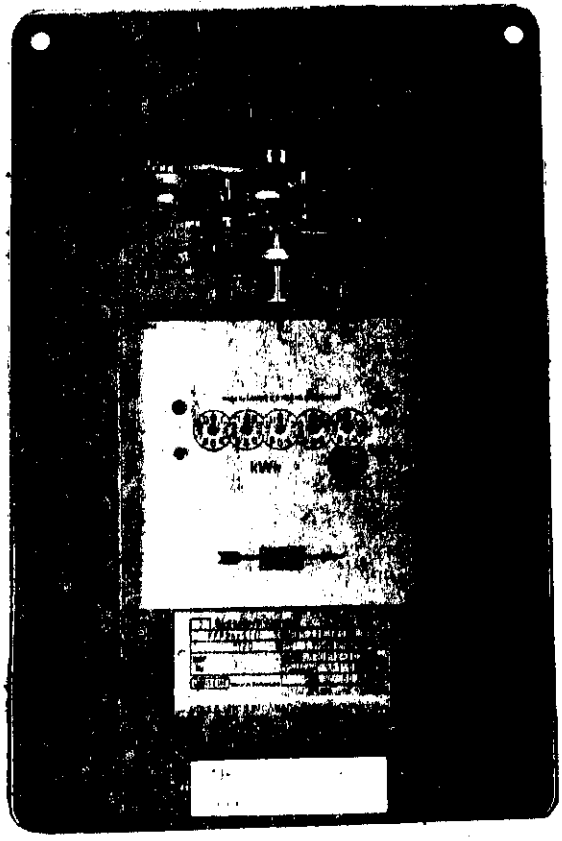
* Approval Attachments:

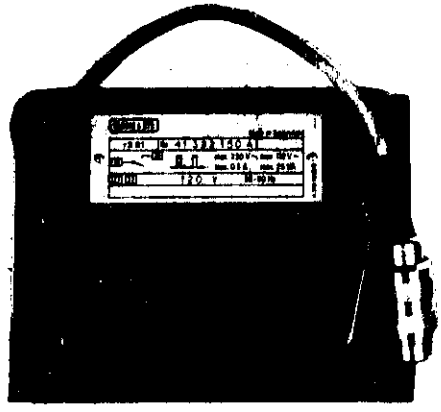
"h"		Reverse-running detent
"r3"		Impulse Device
"r3.13"	3 wire	Impulse Amplifier with mercury-wetted change-over reed contact 1:1
"r3.14"	2 wire	Impulse Amplifier with mercury wetted change-over reed contact, constant duration impulse 80 ms
"r3.21"	2 wire	Impulse amplifier with dry reed contact, constant duration impulse 80 ms
"m"		Maximum Demand Register, integrating period controlled by separate time-switch
"my"		Maximum Demand Register, integrating period controlled by built-in synchronous motor
"mye"		Maximum Demand Register, integrating period controlled by built-in mechanism with one contact
"f1" and "f2"		Switchboard cases, flush and surface

* The incorporation of any of these attachments will be shown in the Type designation, e.g. "FL 347 h mye r3.14f1".

For both r13 and r14 contacts, rating is max. 250V, 100 mA, ac or dc. For r21 contact, max. 250V ac or 110V dc, max. 100 mA.







Description

L300 Series is a new line of polyphase watthour meters equipped with an internal inductive type sensing unit and, optionally, an impulse amplifier and transmitting contacts which mount on the meter terminal cover.

These meters succeed the types "FF8" and "MF8".

The new polyphase watthour meters, types "FL 347" and "ML 347" of the 2-element and 3-element configuration, respectively, are intended for the measurement of large loads in conjunction with instrument transformers on 3-phase 3-wire and 3-phase 4-wire Wye services, respectively.

The driving elements are arranged one above the other and are firmly secured to a sheet steel frame which is suspended from the top and held parallel to the housing base by two screws. The arrangement of the elements from top to bottom corresponds to the phases A, B and C.

There is only one basic frame used for the 2-element and 3-element meters, and in the case of the 2-element meter the bottom current and voltage coils are omitted but not the corresponding disc.

The insulated windings of the voltage coils are contained in a pot-shaped housing made of plastic material and filled with epoxy-resin.

The current coils are made of varnish insulated copper wire and laid into a two-piece thermoplastic case.

The rotor consists of three discs of aluminum alloy on a common shaft and rests on a double-jewel lower bearing with a highly polished steel ball set between them. The upper bearing is a neck bearing with a guide pin made of stainless steel.

The adjustments are similar to those of the previous Landis & Gyr watthour meters with the exception of an addition of a "Phase Rotation Sequence Adjustment" which is preset by the factory as the proper setting is contingent upon the availability of good polyphase calibration equipment. The purpose of this adjustment is to reduce errors caused by mutual coupling between individual potential coil fields. To a large extent such errors depend on the geometry of a particular meter. While it is possible to compensate largely for this effect by judicious use of the low load compensation vanes, this method also restricts the freedom of use of the low load compensation and is therefore not very practical.

Meters of the L300 series have, therefore, been equipped with a special Phase Rotation Compensator which permits adjustment of the phase sequence influence, independent of the low load adjustment. It consists of a pivoting flag, controlled by a lever, and creates an artifical distortion of the field symmetry of the neighbouring voltage coils.

Full-load adjustment uses one or two brake magnets depending on the rated loading of the meter. The lower magnet, mounted on the lower bearing bracket and acting on the bottom disc, is adjustable. The second brake magnet, when provided, acts on the centre disc and is not adjustable.

The meter enclosure consists of a pressed steel case and a sheet aluminum cover. The glass viewing window extends over the complete front surface of the cover, which is secured by four sealable screws.

These meters may be equipped with a built-in inductive type "r3" sensing unit, which, when used with a impulse amplifier "r3.13". "r3.14" or "r3,21", allows transmission of energy pulses for remote integration, summation and averaging of electrical energy. The number of impulses transmitted is directly proportional to the measured energy. The sensing unit is coupled to the meter rotor spindle by means of a fixed spur-wheel drive (through two plastic gears and reduction gears). A reverse-running stop, "h", having 30 serrated teeth, may be fitted to the first spindle of the coupling gear, thus preventing both the meter and the sensing unit from running backwards. Meters not equipped with impulse generators and reverse running stop are not fitted with the r3 sending unit; meters with reverse running stop, but without pulse generators would be fitted with the sensing unit cage only, without the electrical parts.

The scanning disc can be supplied with 6 or 2 slots, depending upon the desired ratio between the disc revolutions of the meter and the number of transmitted pulses. Variable gearing (ratio wheels) is available.

The electronic impulse amplifier, controlled by two scanning heads, is housed in a supplementary case which mounts on the terminal cover. In addition to the electronic circuits, the impulse amplifier contains the supply unit (with galvanic separation from the auxiliary voltage supply) and an output relay. The supplementary case fits all meter cases with suitable terminal covers. The connection between the scanning heads and the terminal block of the impulse amplifier is a via a three-conductor cable which occupies only one meter terminal position. To remove the amplifier

assembly, remove the sealing screws on top of the amplifier unit and pull the unit off the terminal cover. Do not loosen the terminal cover screws for this purpose. The amplifier unit is plugged into the terminal strip which is mounted on the terminal cover".

Meters in panelboard casing f1 have a plug socket for a concentric cable connector on the terminal side. The amplifier unit is supplied on a mounting board that has to be mounted separately to the meter. This mounting board is fitted with the same terminal strip as present on the terminal cover for surface meters, and is supplied with a concentric cable with connector matching the plug socket on the back of the f1-casing. The plug connection is polarized and can only be made in the proper way. The amplifier units themselves are the same for flush or surface type meters.

The sensor within the meter provides a signal to the electronic circuitry which in turn activates the transmitting relay. The relay contacts are of the electrically dry type.

Different executions are available depending upon the requirements, by selecting different types of transmitting relays, i.e. types "r.13", "r3.14" or "r.21".

Type "r3.13" is a mercury-wetted change-over reed contact 1:1 and provides "dry-type", single-pole double-throw (SPDT) relay. When the meter rotor is stationary (zero meter load), a continuous contact is made on one side or the other. This relay is for bistable, bi-directional 3-wire pulses.

Type "r3.14" is a mercury-wetted contact relay and provides "dry-type", two-wire closures of 80 msec constant duration. The relay is actually a SPDT type and connections must be made correctly or the output will be incorrect. Only terminals 35 and 36 should be used. At zero load, the contacts remain open, that is, if the normally open side of the relay is used. This type of relay is used for monostable, unidirectional 2-wire pulses of constant duration.

Type "r3.21" is a non-wetted, single-pole, single-throw (SPST) reed contact relay. At zero meter load, the contacts are open. Otherwise, it is of the same design as the "r3.14", and similar to the "r6" (E-34).

The meter carries a plate which shows the impulse value (Ki) and the impulse value definition. The impulse amplifier is inscribed with its type designation (e.g. r3.14) and the required auxiliary voltage. It is not necessary to make reference to the number of a particular transmitting meter because any r3 impulse amplifier can be used with any suitable meter. Additionally, a plate on the impulse amplifier shows the output contact configuration, its terminal numbering and the pulse format.

The maximum demand attachments "m", "my" and "mye" are the same elements as used on the "F8" meters and were previously approved under Circular SD-EA.366 (July 7, 1958), S-EA. 420 (Oct. 22, 1959) and S-EA. 453 (May 27, 1960).

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