DEPARTMENT OF

TRADE AND COMMERCE
CANADA

S-EA.556

STANDARDS BRANCH

OTTAWA June 25, 1962.

TYPE APPROVAL

LANDIS & GYR IMPULSE SUMMATORS TYPE "CA--"

The apparatus specified and illustrated herein has been duly approved by the Standards Branch under the provisions of the Electricity Inspection Act, Chap.94, R.S. 1952, and may be admitted to verification in Canada.

Apparatus Approved: Types "CAA1", "CAB1", "CAC1", "CAA3", "CAB3" and "CAC3" Impulse *Summators*, manufactured by Landis & Gyr, Zug, Switzerland, and distributed in Canada by Landis & Gyr, Inc., 725 Decarie Blvd., Montreal 9, P. Q.

Rating of Apparatus:

Receiver Relay

Maximum permissible impulsing rate	80 impulses per minute
Duration of impulse (at *transmitting contact*)	0.06-0.08 second
Consumption of relay coil	0.85 W (1.0 VA) approx.
Transmitting Voltage	115 volts
Frequency	60 cycles

Servo Motor for Winding Clockwork

115 to 230 volts, 60 cycles, 5.2 W (13.0 VA)

Impulse Accumulator and Re-Transmitting Device

Maximum permissible impulsing rate	80 impulses per minute (reception and delivery)
Rating of re-transmitting contact	115 volts, 60 cycles, 0.02 amps.
Impulse storage capacity	350 impulses

Servo Motor of Impulse Accumulator

115 to 230 volts, 60 cycles, 2 W (2.5 VA)

Description: *The Summator* is basically an impulse counter and as such is used for the summation of several energy quantities which are delivered to the summator in the form of pulses generated by contacts such as the type "r4" (S-EA.417) installed on several electricity meters. The basic requirement for successful summation is that each pulse should represent an identical quantity of electrical energy.

The basic types covered by this approval are:-

CAA - straight summator without re-transmitting relays
CAB - summator transmitting the summated total by mechanical coupling to a Printo-Maxigraph (S-EA.428) housed in the same case
CAC - summator with impulse accumulator and distributor for mechanical coupling

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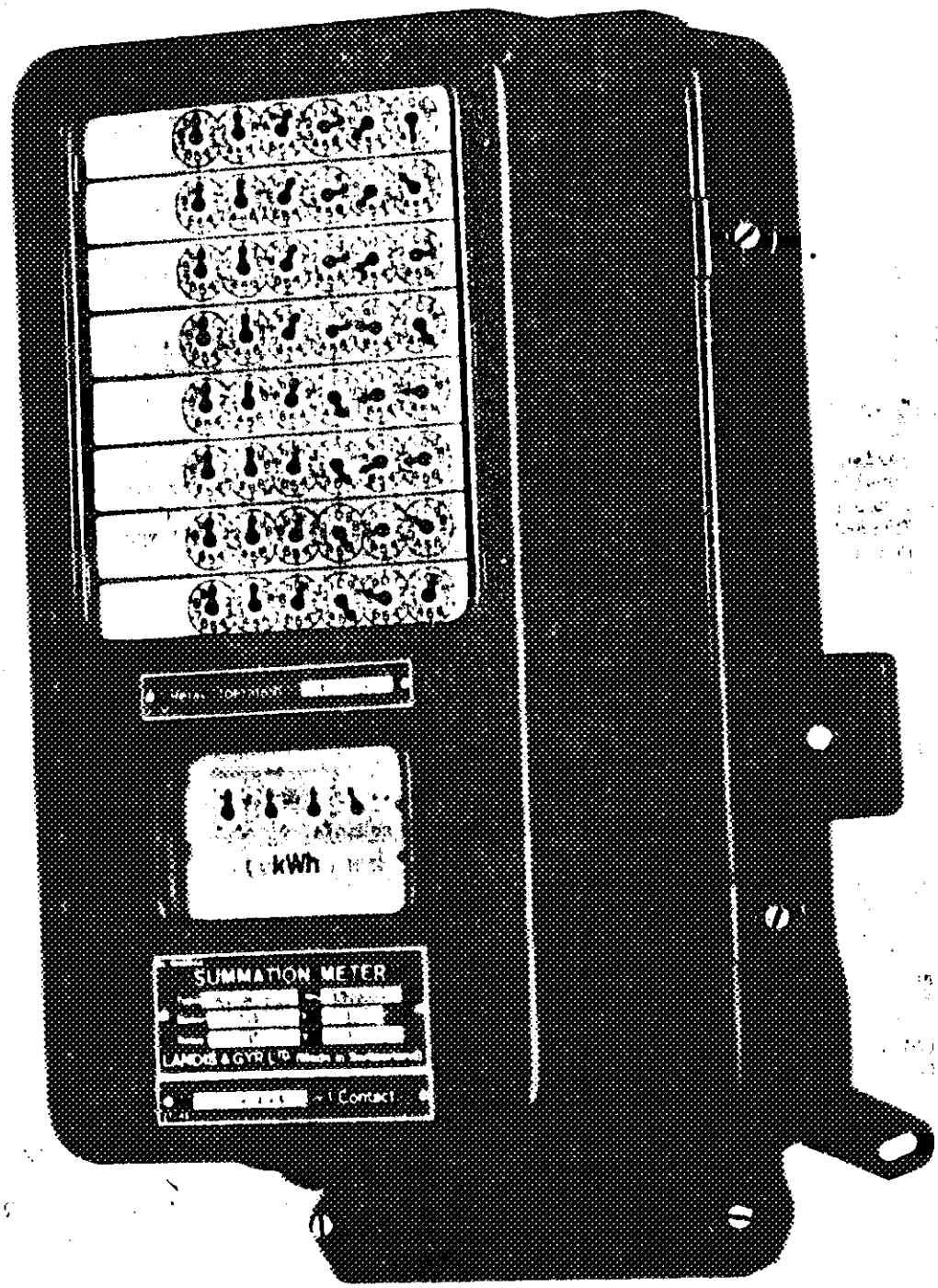
LANDIS & GYR SUMMATOR TYPE "CAC1 (4-4)r"



to a Printo-Maxigraph, and with up to three re-transmitting relays (r) - one for the total and two for any sub-totals.

In conjunction with any of the above the numerals '1' and '3' may be used, as 'CAA1', 'CAC3', etc. The numeral '1' requires that the impulse values to each receiving relay be identical, and the numeral '3' means that a set of ratio wheels can be interposed between the individual receiving relays and the totalizing gear, so that they can accept pulses having different values for each receiver relay. The maximum possible ratio is 100:1.

The driving power to operate the summator is supplied by a built-in electrically-wound clockwork mechanism; the incoming pulses merely trip the relays. The number of relays that can be supplied in any given summator is a maximum of 8, of which all may be positive and up to 7 negative or subtracting. The number of pulses arriving at any given relay is added to its associated register (clock or cyclometer) and the algebraic sum of the pulses arriving at all the relays, positive and negative, is shown on a totalizing register. The summator is designed to give a positive read-out, and if the negative pulses exceed 15 they will be lost.

In the type 'CAC1' there may be up to 3 re-transmitting devices (r) which re-transmit the algebraic total and 2 sub-totals. The numbers following the type designation indicate the function of the receiving relays, and the position of the 'r' (re-transmitting device) with relation to the numbers indicates what is re-transmitted, e.g., "CAC1(2r+3-3r)r" means a summator with 8 relays, 5 of which are positive and 3 are negative, and 3 re-transmitting contacts for transmitting the sub-totals of 2 positive and 3 negative relays respectively and the algebraic total summed by all the relays.

In order to make the registers direct reading in primary units, on the 'CAC3', reduction gearing is available for insertion between the relays and the registers, and as the summator is designed for positive summation and is limited to 80 pulses per minute, it is necessary in any installation to take care that there is an excess of positive pulses and that the summation total does not exceed this rate. If it should happen that this rate should be exceeded, a reduction gearing is available to bring the output rate to less than 80 pulses per minute in which case a multiplier will be required. The registers are stacked one above the other and will be identified as to the function, additive or subtractive. The summation register will be on a separate dial below the other registers.

This approval covers the use of the summator with the following associated equipment:

r4 - - - - - - -	contacts on transmitting meter (S-EA.417)
RG/Rmw - - - - -	Tele-Printo-Maxigraph and accessories (S-EA.428)
RD/Rmw - - - - -	Maxigraph Remote Recorder (S-EA.422)
NAC1e, NAC2e - -	Maxiprint (S-EA.419)
r - - - - - - -	re-transmitting device (on summators)
f1 and f2 - - -	switchboard mounting, flush and surface.

One of the useful applications of the summator is in connection with the import and export of energy, or where a quantity of energy has to be subtracted for station use.

Open-circuit conditions in the transmission line will not cause counting, and short-circuit conditions will count only one pulse.

The wiring diagram for any given installation should give all the information required to connect the transmitting meters with their correct summating relays, and the output(s) of the summator to the associated pieces of recording equipment.

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p.t.o.

In verifying an installation it will be necessary to check that the kilowatthours, etc. per pulse are given, and that all multipliers, whether due to transformer ratios or gear ratios, are accounted for.

E. F. Power,
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