CANADA

DEPARTMENT OF TRADE AND COMMERCE

STANDARDS BRANCH

S-EA.629

OTTAWA, June 24, 1964.

TYPE APPROVAL

SANGAMO TYPE "SC2" THERMAL GRAPHIC DEMAND METERS

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

Apparatus Approved: Type "SC2" Thermal Graphic Demand Meters, manufactured by Sangamo Company Limited, Leaside, Toronto 17, Ontario.

Rating of Apparatus:

	Rated Amperes	5 and 10 (1)
	Rated Voltage	115, 120, 230, 240, 460, 480, 575 and 600
(2)	Elements	2, 3 and 4
(3)	Response Period (Indication) ...	10 and 16 minutes
	Frequency	60 and 50 (4) cycles
(5)	Max. Ratio	4:1
(4)	Chart Drive	60 cycle synchronous motor
	Chart Speeds	½, 1, 2 and 3 inches per hour
(6)	Inking System	Tubular or quill type pen

(1) By means of internal shunting, the 5 ampere rating can be converted to a 10 ampere rating when these instruments are supplied from the secondaries of three current transformers connected in delta.

(2) Instruments having four elements are used for totalizing the load on two independent circuits, and comprise two independent meters, each with two elements all acting on the common heaters.

(3) The response period is the time required for the pen to reach 90% of its final indication. The term "Indication 90% 16 min." on the nameplates of some instruments is synonymous with "Response Period".

(4) Instruments designed and marked for use on 50 cycles, use a 60 cycle synchronous chart drive motor with different gear ratios to produce the correct chart speeds at the lower frequency.

(5) Applies to totalizing demand meters only. This is the maximum permissible ratio between the final pen readings of the elements of the two meters. (see description)

(6) Tubular pen is covered by circular S-EA.523.

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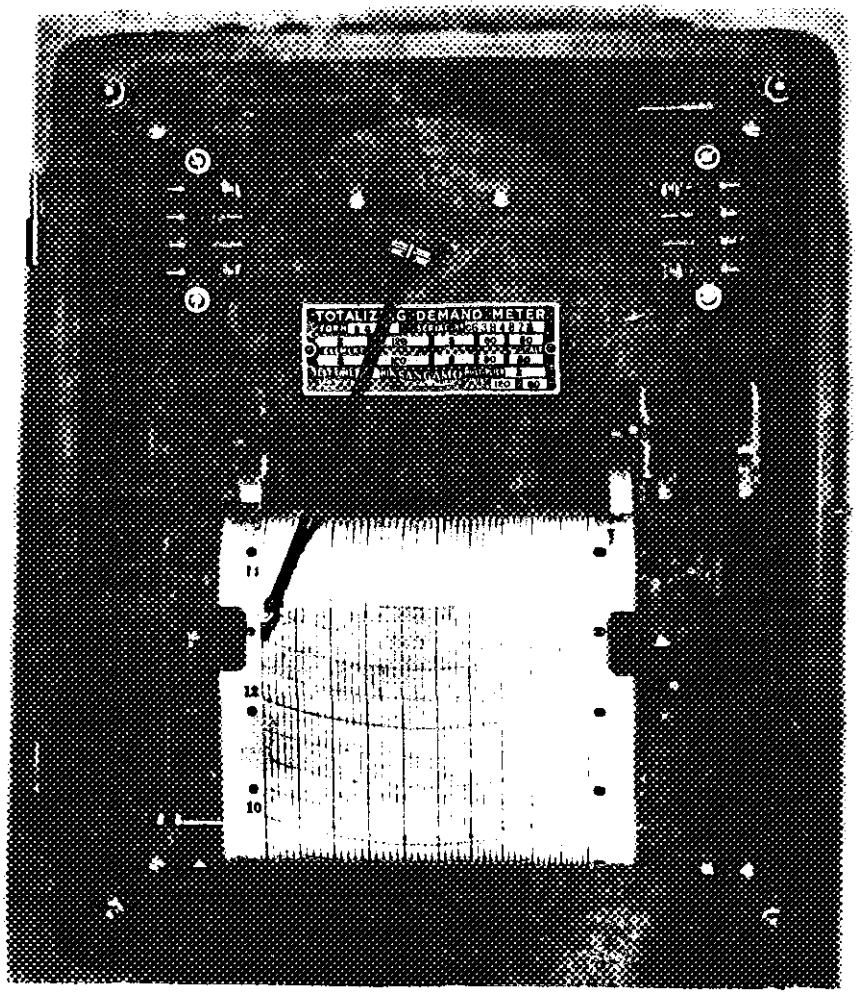
SANGAMO TYPE "SC2" THERMAL GRAPHIC DEMAND METER



SANGAMO TOTALIZING DEMAND METER

TYPE SC-2 4 ELEMENT SERIAL NO. 0000000000

5 AMPS 120 VOLTS 60 ~ SCALE 1500 WATTS

CALIBRATION (2 WATTS ON 1 ELEMENT)	READING	ELEMENTS	P.T.'S	C.T.'S
500	UPPER	2400/120	250/5	
300	LOWER	600/120	600/5	

MULTIPLY BY 1000 INDICATION 90% 16 MIN. 99% 32

CAN. PATENTS 925,132 OTHER PATS. PENDING COMPANY LIMITED MADE IN CANADA TIMING MOTOR 120 V 60 ~

REVISED NAMEPLATE

Description: The type 3G2 Thermal Graphic Demand Meters are identical in external appearance to the type 3G receiving approval under circular 170, NRC-18, NRC-29 and NRC-130. Higher torque is obtained by the use of a heavier bi-metal and higher accuracy by the use of a second independently-adjustable calibration spring intended as a factory adjustment. Routine changes in calibration will be obtained by the usual calibration spring.

The 2- and 3-element designs are conventional in that the same test load will produce the same pen indication when applied to each of the separate elements.

The 4-element totalizer design differs from the 2- and 3-element design in that each of the two meters may have, by the use of internal shunts, the same or different calibrations. The maximum ratio covered by this approval between the two meters is 4:1.

The meters may be calibrated so that a test load applied to each element separately of meter "A" may result in a pen indication of 100 and the same test load applied to each element separately of meter 'B' may result in a pen indication of 400. In service, the elements of meter "A" will be connected to the secondaries of the CT's and PT's of one circuit, and the elements of meter 'B' to the secondaries of the CT's and PT's of the other circuit.

For successful totalizing it is essential that each division on the chart represent the same quantity of primary energy, regardless of the possible different overall CT and PT ratios used on each circuit.

Taking another example; if circuit "A" had 250/5 CT's and 2400/120 PT's the overall multiplier would be 50x20 or 1000, and if circuit 'B' had 600/5 CT's and 600/120 PT's, its overall multiplier would be 120x5 or 600, but the output from the secondaries of the transformers on each circuit would have the same nominal value, [illegible]at 500 watts from the secondaries of the transformers on circuit [illegible] would represent 500 x 1000 or 500,000 primary watts and from circuit [illegible]00 x 600 or 300,000 primary watts.

To make the pen indication equivalent to the same number of primary watts on each circuit, the meter supplied from the secondaries of the transformers on the circuit with the lower ratio is shunted internally so that it reads, in the case of the example, 300.

Nominal load on circuit "A" will result in a pen indication of 500 per element and on circuit 'B' an indication of 300 per element. A common chart multiplier of 1000 applied to these readings means a load on circuit "A" of 500,000 watts and 300,000 watts on circuit 'B'.

The revised totalizer nameplate illustrated on the back of the

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circular includes all the information required to verify end use these instruments with minimum chance of error. The elements may be marked 'upper and lower' or 'right and left', referring in each case to the location of the terminals.

The pen indication that the given test load applied to each element will produce, the transformer ratios of each circuit and the chart multiplier are all shown on the nameplate.

The usual chart scales are 1000 and 1500 watts.

W. J. S. Fraser

(for) E. F. Power,
Chief, Electricity & Gas Division,
Standards Branch.

R. W. MacLean,
Director,
Standards Branch.

Reference: A490C