DEPARTMENT OF

TRADE AND COMMERCE
CANADA

STANDARDS BRANCH

G-EA.495

OTTAWA February 1, 1961.

TYPE APPROVAL

SANGAMO TYPE "NBVS" 2½-ELEMENT COMBINATION POLYPHASE WATTHOUR AND THERMAL KVA DEMAND METER

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 "NBVS" 2½-Element Combination Polyphase Watthour and Thermal KVA Demand Meter, manufactured by Sangamo Company Limited, Leaside, Toronto 17, Ontario.

Rating of Apparatus:

Current Range	2.5-200 amperes
Voltage	120/208
Elements	2½ wye
Frequency	60 cycles
Disc Constant	18
Full Scale Demand	75 KVA
#Multiplier	50
Register Ratio	555-5/9
Register Type	Clock, 4-dial plus test dial
Test Period	32 minutes

Applies to both watthour and demand elements.

Description: This meter is intended for use on 3-phase 4-wire wye services at 120/208 volts. It measures watthours and voltamperes at any power factor, lagging or leading, without adjustment and without reference to phase rotation. Its application is therefore much the same as the "4L2" meter.

The meter is made up of two entirely separate sections, watthour and demand. The watthour section consists of a low-ampere rating, 2-element "NB" meter connected to the secondaries of two current transformers, each having two primaries. The demand section consists of a demand element similar to that in a type "NBD" meter, with three current transformers and two potential transformers. All these transformers are mounted on the socket base-plate and completely encapsulated in epoxy resin.

The "NBVS" demand element differs from that in the "NBD" demand element in that DC is applied to the heaters. This DC is obtained from the three current transformers through a bank of six silicon rectifiers and from the potential transformers through a bank of four rectifiers. Rectification

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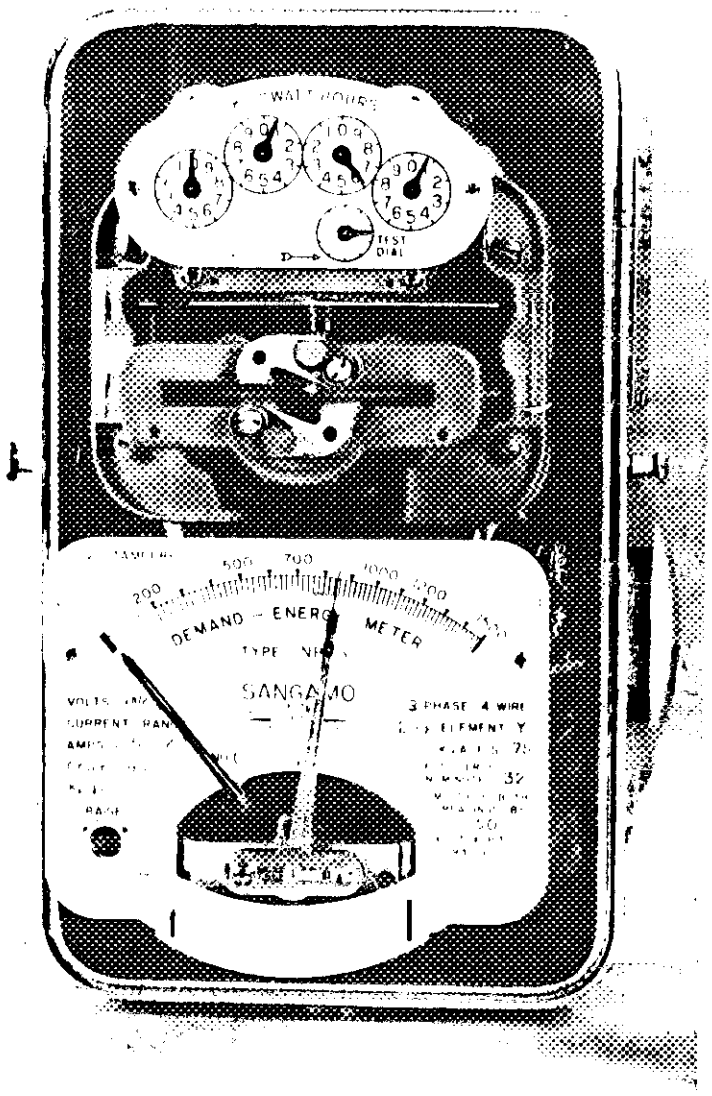
SANGAMO TYPE "NBVS" 2½-ELEMENT Y COMBINATION POLYPHASE
WATTHOUR AND THERMAL KVA DEMAND METER



in all cases is full wave. The DC from the potential transformers is passed through a reactor to suppress ripple and make the indication almost independent of power factor, particularly on polyphase.

Because the currents from the three current transformers and two voltage transformers are rectified first and then added, the magnitude of the resulting currents is independent of the phase positions of the currents and of the voltages. There is therefore no connection by means of which the demand pointer can be driven down scale.

The watthour section has the conventional split coil in the current circuit, but the demand section has three identical current coils, each giving the same pointer deflection for the same load.

Due to some residual ripple in the rectified DC from the potential circuits reacting with the unfiltered DC from the current circuits, the pointer indication will be approximately 1.5% high at 0.5 P.F. lagging when testing on single-phase. This high reading will largely disappear when the correct polyphase service voltages and currents are applied.

This meter is approved for use only in a high capacity socket.

E. F. Power

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

R. W. MacLean,
Director,
Standards Branch.

Ref: A-884A