



## STANDARDS DIVISION

OTTAWA,..... January 28, 1957.

TYPE APPROVAL

SANGAMO TYPES "NBDP" AND "NBDS"  
POLYPHASE COMBINATION WATTHOUR AND THERMAL DEMAND METERS

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

Apparatus Approved: Types "NBDP" and "NBDS" 2- and 2 $\frac{1}{2}$ -element Polyphase Combination Watthour and Thermal Demand Meters, manufactured by the Sangamo Company Limited, Leaside, Toronto 17, Ontario.

## Rating of Apparatus:

2-Element -

Voltages .....	115, 230, 460, 575				
	or 120, 240, 480, 600				
Current Range .....	.12-7.5, .25-15, .5-40, 1.2-75, 2.5-150				
KW full scale .....	1.5      3.0      7.5      15      30				
Demand scale, watts .....	1500      1500      1500      1500      1500				
Meter Multiplier .....	1      2      5      10      20				
Watthour K <sub>h</sub> .....	.6      1.2      2.4      6.0      12				

Note: Values for "KW full scale", "Meter Multiplier" and "K<sub>h</sub>" are given for 115 or 120 volts. For other voltages multiply by 2, 4 or 5.

2 $\frac{1}{2}$ -Element, Wye -

Voltages .....	120/208, 240/416				
Current Range .....	.12-8.5, .25-20, .5-40, 1.2-85				
KW full scale .....	3      7.5      15      30				
Demand scale .....	1500      1500      1500      1500				
Meter Multiplier .....	2      5      10      20				
Watthour K <sub>h</sub> .....	.9      1.8      3.6      9				

Note: Values for "KW full scale", "Meter Multiplier" and "K<sub>h</sub>" are given for 120/208 volts. For 240/416 volts multiply all these by 2.

...../2  
(2 $\frac{1}{2}$ -element, Delta)



2 $\frac{1}{2}$ -Element, Delta -

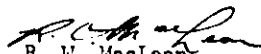
Voltages .....	115/230 or 120/240			
Current Range .....	.12-7.5, .5-37.5, 1.2-75, 1.5-100			
KW full scale .....	3	15	30	40
Demand Scale .....	1500	1500	1500	1000
Meter Multiplier .....	2	10	20	40
Watt-hour $K_h$ .....	1.2	4.8	12	12
Demand Time Periods, all capacities and ratings:				
	10 min. 90%, testing time 20 min.			
	16 min. 90%, testing time 32 min.			
Frequency .....	50 and 60 cycles.			

Description: The type "NBD" meter is a combination, in one enclosure, of a type "NB" polyphase watt-hour meter and a polyphase thermal watt demand meter. Type approvals relating to the "NB" watt-hour meters are: SD-EA.133, December 11, 1953; SD-EA.147, April 5, 1954; and SD-EA.240, April 11, 1956.

The watt-hour element is essentially the same as in the various "NR" meters already approved, but slightly modified to improve the construction. The modifications centre around the light load vane and the Class II temperature compensation. The main constructional advantage is the elimination of the crowded conditions on the pole face. The effect on performance is negligible. The thermal demand section is essentially the same as currently in use in the Sangamo types "EDA" and "EDS" combination watt-hour and demand meters and carries the same adjustments. The driven pointer has been made straight instead of offset to improve balance. Both the current and demand potential transformers are of improved design. Current transformers are used in all capacities so as to utilize the matching characteristics of current and potential transformers. Type approvals relating to "ED" meters are: NRC-166, January 6, 1947 and SD-EA.5, May 16, 1950. The new current transformer design is used in three-phase four-wire "4L2" meters approved under SD-EA.266, October 18, 1956.

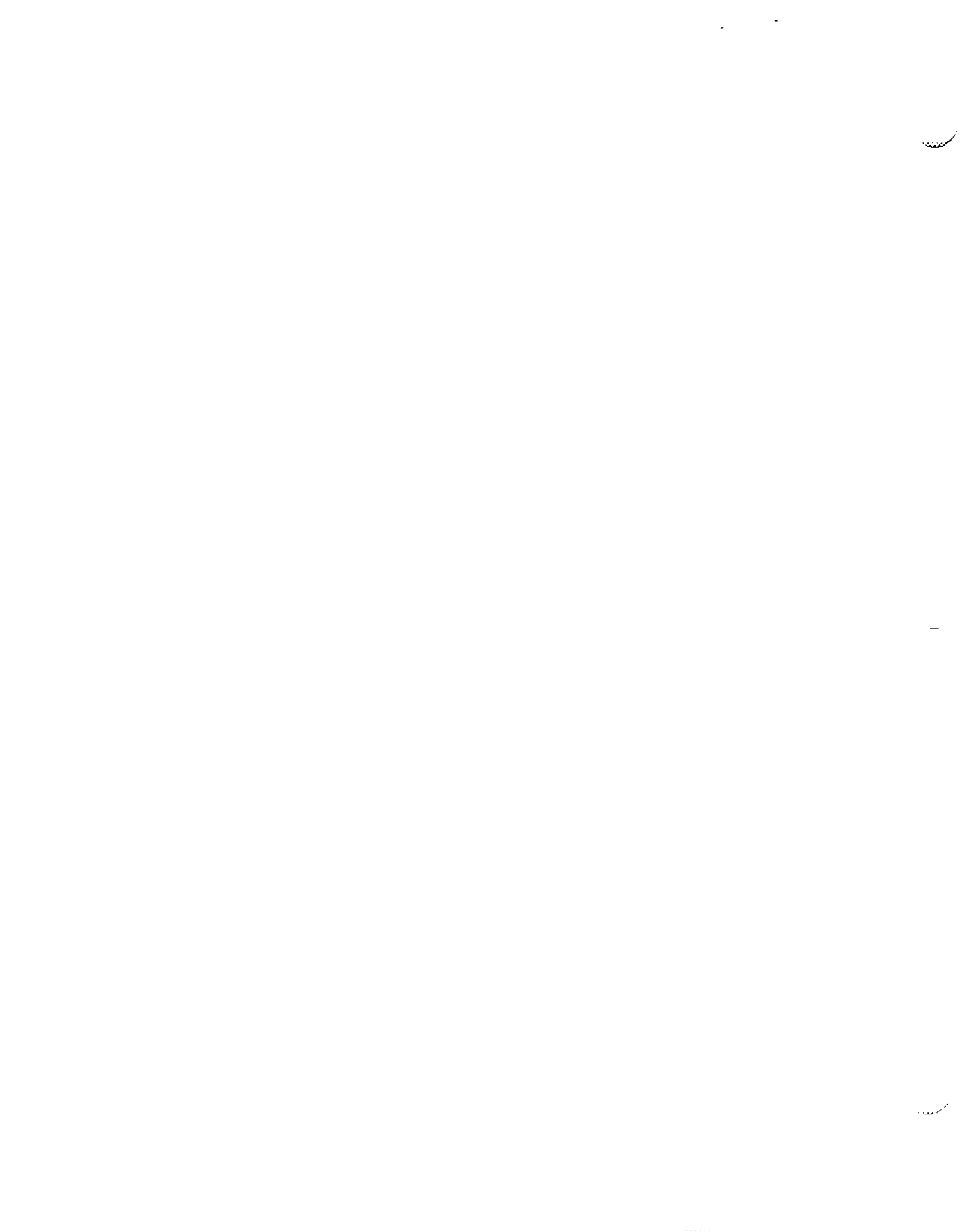
Two kinds of terminal connections will be supplied, bottom-connected (NBDF) and socket-type (NBDS). Two-element meters will be available for two-phase, three-phase three-wire, and network, and 2 $\frac{1}{2}$ -element meters for three-phase four-wire services. The bottom-connected base has a moulded block with provision for a maximum of eight current and six potential terminals. To cover the various self-contained and transformer types. Unused openings are blocked with insulating inserts. The socket type is available both self-contained and for use with transformers. Internal connection diagrams are affixed to the meters. The enclosure for the bottom-connected meter is a die-casting with a rectangular glass cover secured in place by locking levers. The socket-type base is a sand casting similar to the die-casting, using the same cover.

Registers are of the clock type as used in "NB" watt-hour meters. The same meter multiplier applies to both watt-hour and demand readings.

  
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Ref: A-552



SANGAMO TYPE "NBDS" DEMAND-ENERGY METER

