DEPARTMENT OF TRADE AND COMMERCE

STANDARDS BRANCH

CANADA

E-19

OTTAWA March 29, 1966.

NOTICE OF APPROVAL

FOR

SANGAMO TYPES "P4OS" AND "P4OP" 2-ELEMENT AND 2½-ELEMENT Y REACTIVE ENERGY METERS

Apparatus

Current Range	0.12-10 Amperes				
Voltages	120	240	345	480	600
Varhour disc constant (Kh)	1.8	3.6	5.4	7.2	9.0
(1) Single Phase watthour disc constant	1.04	2.08	3.12	4.16	5.20
(2) Single Phase Test Constant	.577 for all ratings				
Register Ratio (Rr)					
4 & 5 dial x 1	111-1/9	55-5/9	37-1/27	27-7/9	22-2/9
4 dial x 10	1111-1/9	555-5/9	370-10/27	277-7/9	222-2/9

2½ ELEMENT Y

Current Range	0.12-10 Amperes		
Voltages	120	240	345
Varhour disc constant (Kh)	1.8	3.6	5.4
(1) Single Phase watthour disc constant	3.12	6.24	9.36
(2) Single Phase Test Constant	1.732 for all ratings		
Register Ratio (Rr)			
4 & 5 dial x 1	111-1/9	55-5/9	37-1/27
5 dial x 10	1111-1/9	555-5/9	370-10/27
(3) Phase Rotation	ABC		
Frequency	60 cycles		
Detent	Approved with and without detent. All registers will have test dials.		

(1) The single phase disc constant marked on the nameplate is in watthours, and is the value to be used when verifying these meters on single phase

(2) The single phase test constant is the multiplier that is to be applied to all the prescribed test currents. For example, if one of the prescribed test currents according to the nameplate is 5 amperes, the single phase test current that should be applied would be 5 x .577 or 2.89 amperes for the 2-element and 5 x 1.732 or 8.66 amperes for the 2½ element Y.

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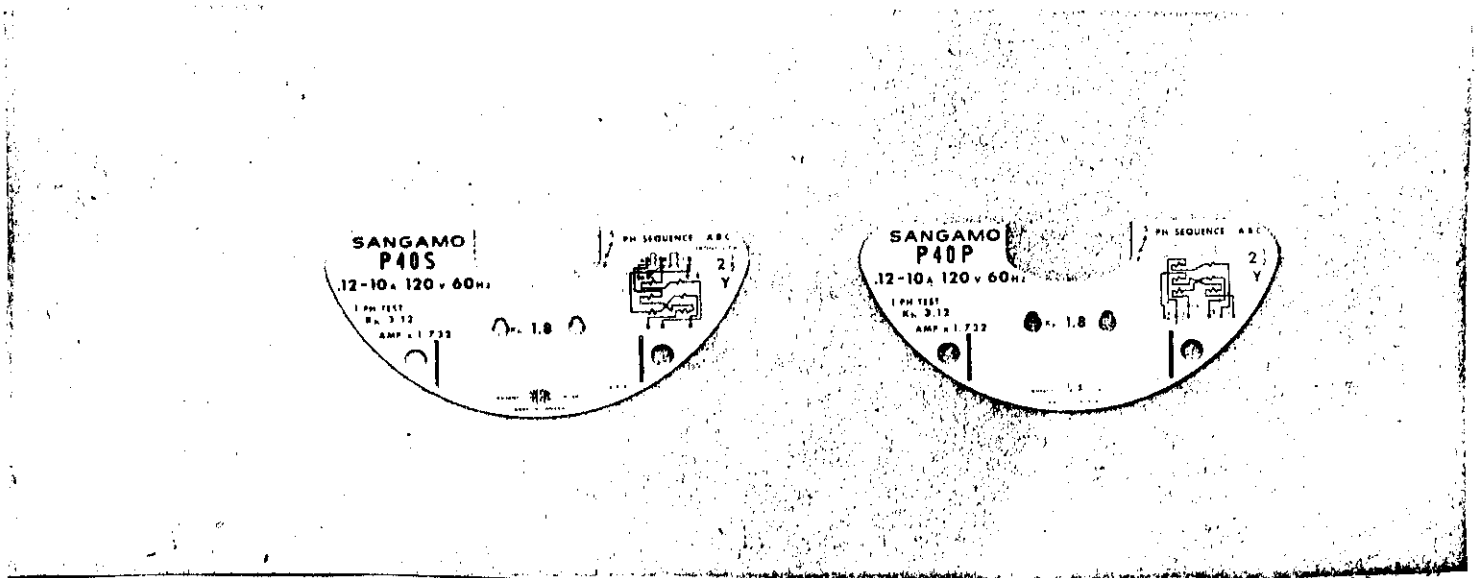
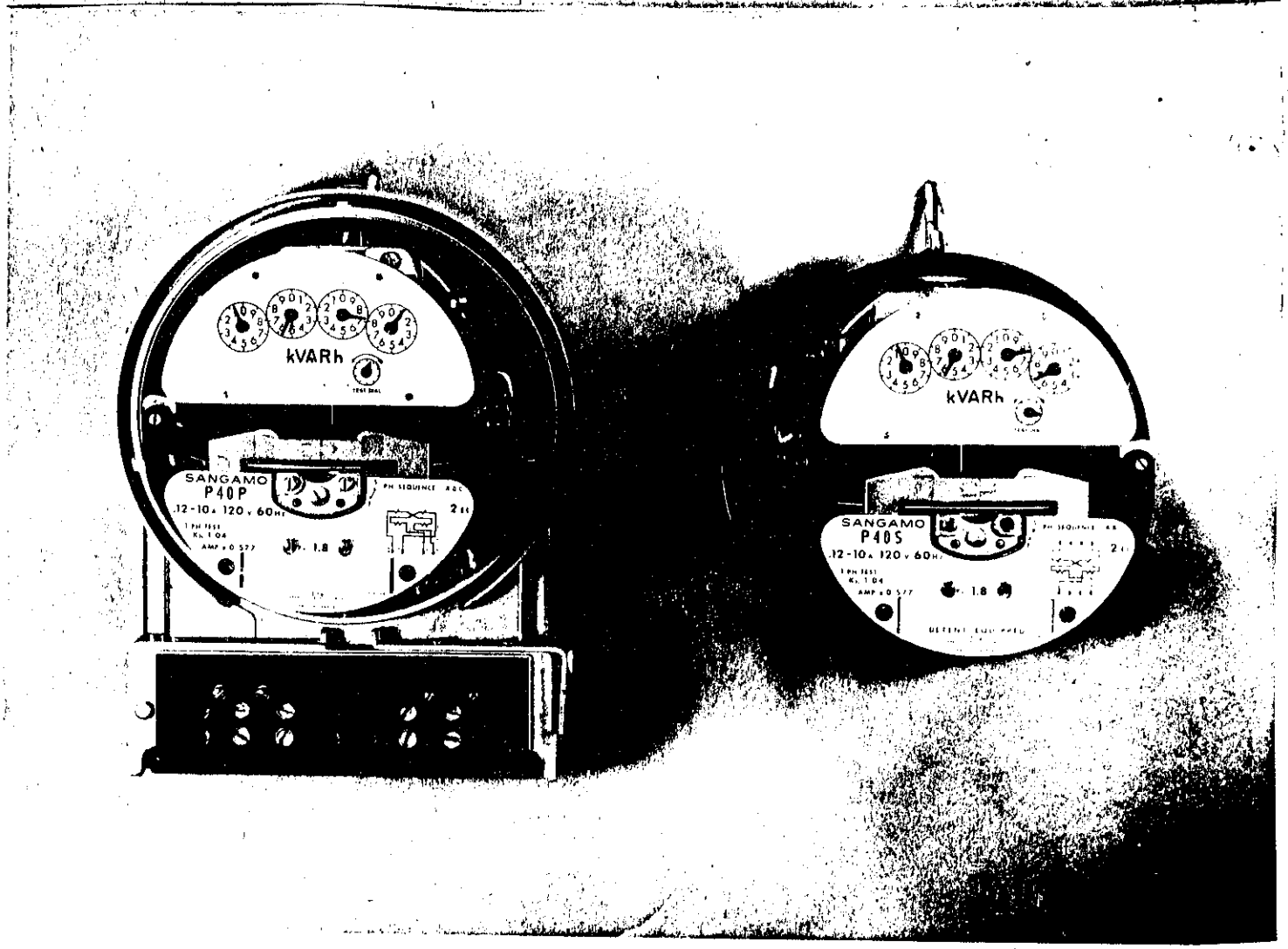
SANGAMO TYPES "P4OS" AND "P4OP" 2-ELEMENT AND 2½-ELEMENT Y
REACTIVE ENERGY METERS





Apparatus (Con'd)

These multipliers must also be applied to the register readings when dial testing on single phase. The register ratio (Rr) matches the disc in Varhours and therefore when testing on single phase where the disc constant is in Watthours, it will be necessary to apply a multiplier to the register reading.

For example, one revolution of the test dial is equivalent to 1 kilovarhour, so that using the appropriate multipliers, the rotating standard will record 1000 x .577 or 577 watthours for the 2-element meter and 1000 x 1.732 or 1732 watthours for the $2\frac{1}{2}$-element Y meter.

(3) The phase sequence is marked ABC on the nameplate and it is necessary for the correct operation of these meters in service that this be observed, and the meters connected in service according to the connection diagram on the nameplate.

Description

The type P40 kilovarhour meter is basically the same as the type P20 kilowatthour meter. It differs in the arrangement of the windings on the current electromagnet. The 2-element design has two current coils on each electromagnet, and the $2\frac{1}{2}$-element design has three current coils, and in each case one of the coils has twice the number of turns of the other(s).

When verifying a 2-element meter on single phase, because of the direction in which the current coils are wound, it is necessary to reverse the connections to the voltage coil of the right-hand element for forward rotation of the disc.

When verifying a $2\frac{1}{2}$-element meter on single phase, for the same reason it will be necessary to reverse the connections to the voltage coil of the right-hand element and reverse the direction of B current.

The 2-element meter may be used to meter the reactive energy in a 3-phase 4-wire Y circuit if the current circuit is fed from the secondaries of three current transformers connected in delta similar to the connections of a 2-element watthour meter.

In this application, the connections differ from those of the 2-element watthour meter in that (a) the current to element "A" and (b) the potential to element "C" of the varhour meter are connected in reverse polarity.

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Description (Con'd)

A more complete description of the operation of these varhour meters will be found in Technical Bulletin No. 6.

Approval granted to The Sangamo Company Limited,
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