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NOTICE OF APPROVAL
AVIS D'APPROBATION

E-66-4

Ottawa, July 21, 1977

SANGAMO TYPE "KYL-"COMBINATION POLYPHASE
WATTHOUR AND THERMAL VOLTAMPERE DEMAND METER

Types KYLP, KYLS and KYLF (Transformer Types)

2½-element delta for use on 3-phase 4-wire delta service
Voltages 240 and 480
Current Range (amperes) 0.12-8
*Full Scale Demand (kVA) 3
*Multiplier 2
*Disc Constant (Kh) 1.44
Register Ratio (Rr) 166 2/3
Scale 1500 voltamperes and 1.5 kVA
Single phase test constant (series) 1.154

Types ** KYLP and KYLS (Self-contained)

2½ element delta for use on 3 phase 4 wire delta service
Voltage 240 and 480

Current Range (amperes)	0.3-25	0.6-50	1.2-100	2.5-200
*Full Scale Demand (kVA)	10	20	40	80
*Multiplier	10	20	40	80
*Disc Constant (Kh)	3.6	7.2	14.4	28.8
Register Ratio	333 1/3	333 1/3	333 1/3	333 1/3
Scale	1000 voltamperes and 1.0 kVA on all ratings			

Single Phase kVA test constant (series) 1.154

* Full scale value, multiplier and disc constant are given for 240 volts, for 480 volts multiply by 2.
Multiplier applies to both watthour and demand meter readings.

** Maximum Current of "P" base meters is 100 amperes.

Frequency 50 Hz and 60 Hz (all types and ratings).

Indication (all ratings) 90% in 15 minutes, 99% in 30 minutes.

All registers have test dials.

All ratings can be supplied with potential indicating lamps.

Potential Circuit Burden at Rated Voltage

	60Hz			50 Hz		
Phase B	2.6W	9.2VA	8.8RVA	3.0W	12.5VA	12.2RVA
Phase A	1.0W	7.9VA	7.8RVA	1.3W	9.7VA	9.6RVA

Transformer Type Current Coil Burden at 5 amps.

	60Hz			50 Hz		
Phase B&C	1.3W	2.2VA	1.8RVA	1.3W	2.0VA	1.5RVA
Phase A	2.1W	3.9VA	3.2RVA	2.0W	3.4VA	2.7RVA

Single Phase kVA Test Constants

Current Coil A only	1.366
Current Coil B only	2.0
Current Coil C only	2.0
Current Coils B plus C	1.0
All Coils in Series	1.154

Description

This Notice constitutes an addition to Notice of Approval E-66-3 to include the 2½ element delta service.

The watt hour section of these meters conforms to the 2½ element delta ratings approved under Notice of Approval E-65-4 except for the addition of the 480 volts rating.

The kVA demand section however differs somewhat from those previously approved. The outputs of the internal voltage and current transformers are rectified and added and fed into the heater network of the sensing elements in a manner similar to other"LY" type meters.

However the voltage selected for metering is obtained from two internal potential transformers, the primary windings being connected across potential BC and the secondaries combined to produce an output proportional to ½ line voltage.

This is the correct voltage for metering single phase loads, but is too low by the factor $\sqrt{3}/2$ for balanced polyphase loads. To compensate for this, the internal current transformer in line A is made to deliver an output higher than those in lines B and C by a factor of 1.464 or $2\sqrt{3}-2$.

The explanation of the single phase kVA test constants is presented in tabular form as follows:

	Wattmeter Reading	Effective Load Applied 3Ø4wΔ Meter	Meter Reading	Single Phase Test Constant
Current Coil A	IV	IV	*1.464$\frac{IV}{2}$	1.366
Current Coil B	IV	$\frac{IV}{2}$	** $\frac{IV}{2}$	2.0
Current Coil C	IV	$\frac{IV}{2}$	$\frac{IV}{2}$	2.0
Coils B plus C	IV	$\frac{2IV}{2}$	$\frac{2IV}{2}$	1.0
All Coils in Series	IV	$\frac{2IV}{2}+IV=2IV$	$\frac{3.464V}{2}=\sqrt{3}IV$	$1.154=\frac{2}{\sqrt{3}}$

* Meter Internal Current Transformer A delivers a higher output by a factor of 1.464.

** Meter Internal Voltage Transformers deliver on output proportional to ½ the applied voltage.

Approval granted to:

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