Department of consumer and corporate affairs / Ministère de la consommation et des corporations

STANDARDS BRANCH - DIRECTION DES NORMES

# NOTICE OF APPROVAL

E-63-1

OTTAWA July 22, 1969.

## SANGAMO TYPE "WY-" POLYPHASE THERMAL KW DEMAND METERS

### Apparatus

**Types WYA and WYS**

2-element Network for use on 2 wires and Neutral of 3-phase 4-wire Y service

| | | | | |
|---|---|---|---|---|
| | Voltages | 120, 277 and 345 volts | | |
| | Max. Current Amperes | 50 | 100 | 200 |
| * | Full Scale (KW) | 12 | 24 | 48 |
| * | Multiplier | 10 | 20 | 40 |
| | Scale | 1200 watts and 1.2 KW | | |

**Types WYP# and WYS**

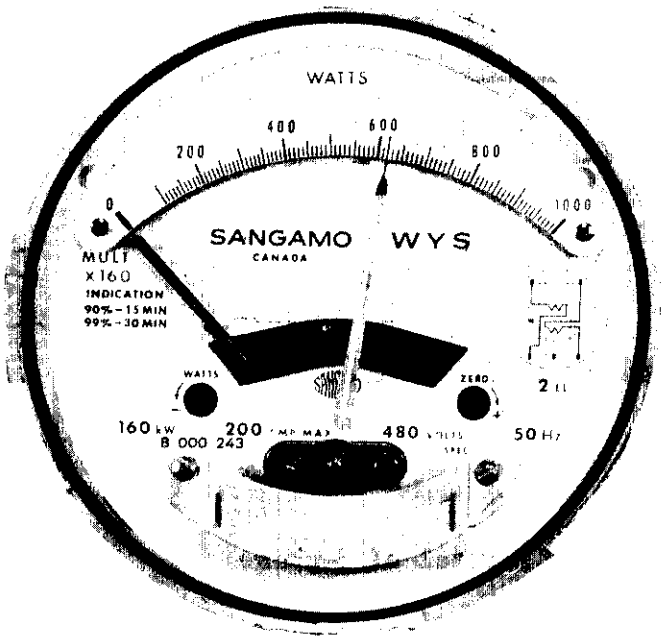
2-element for use on 3-phase 3-wire service

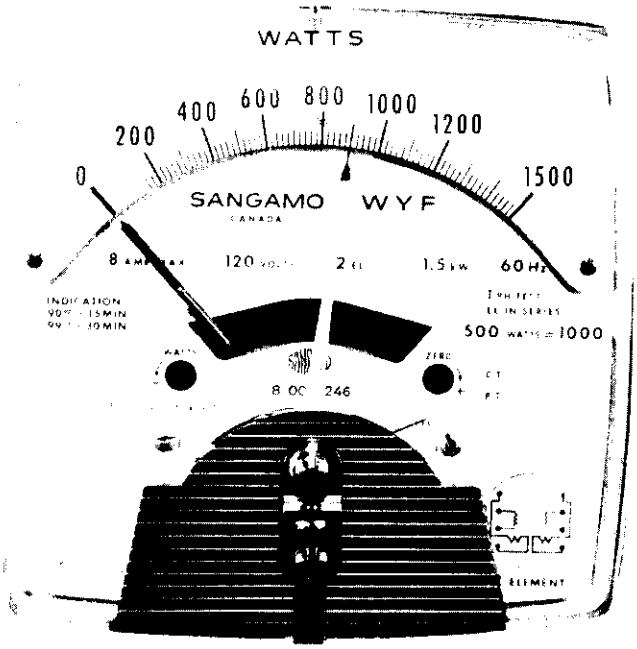
| | | | | | |
|---|---|---|---|---|---|
| | Voltages | 120, 240, 277, 345, 480, and 600 volts | | | |
| | Max. Current Amperes | 25 | 50 | 100 | 200 |
| * | Full Scale (KW) | 5 | 10 | 20 | 40 |
| * | Multiplier | 5 | 10 | 20 | 40 |
| | Scale | 1000 watts and 1.0 KW on all ratings | | | |

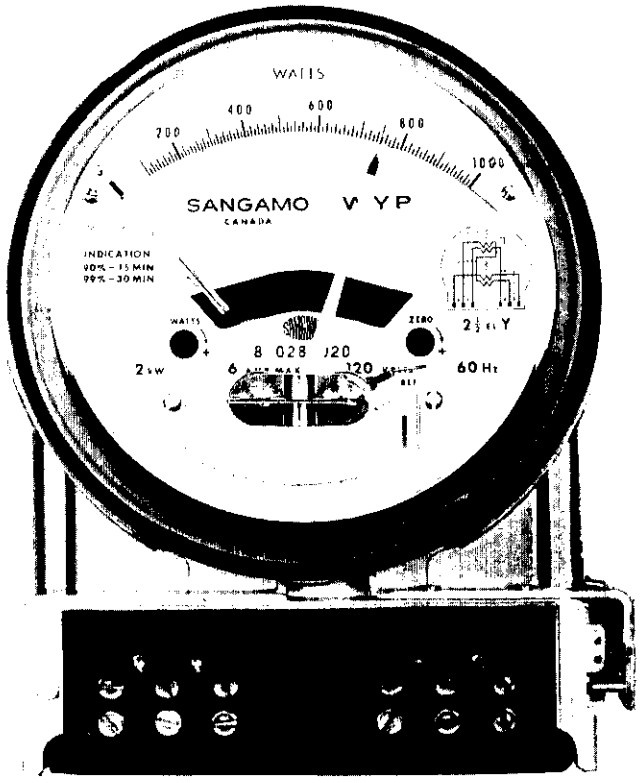
2 1/2-Element Y for use on 3-phase 4-wire Y service

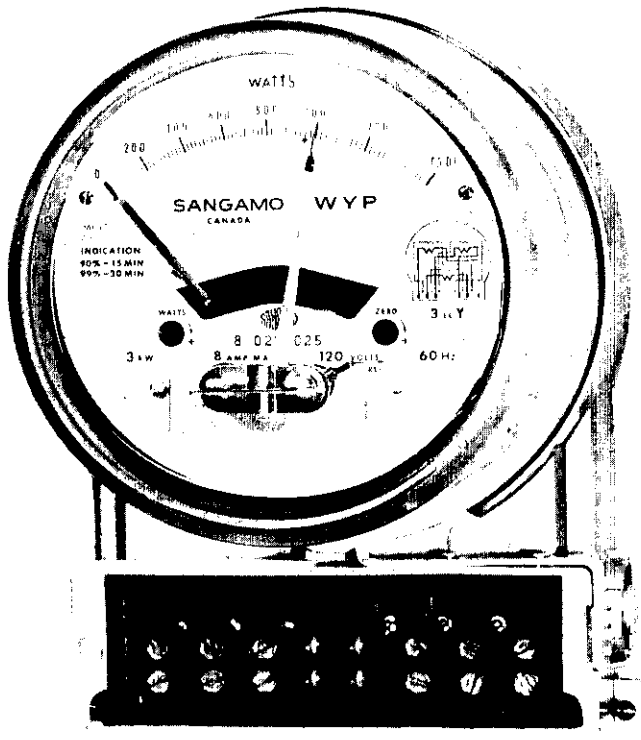
| | | | | | |
|---|---|---|---|---|---|
| | Voltages | 120, 240, 277 and 345 volts | | | |
| | Max. current Amperes | 25 | 50 | 100 | 200 |
| * | Full Scale (KW) | 9 | 18 | 36 | 72 |
| * | Multiplier | 7.5 | 15 | 30 | 60 |
| | Scale | 1200 watts and 1.2 KW on all ratings | | | |

SANGAMO TYPE "WY-" POLYPHASE THERMAL KW DEMAND METERS



2 1/2-Element Delta for use on 3-phase 4-wire delta service

| | | | | | |
|---|---|---|---|---|---|
| | Voltage | 240 | | | |
| | Max. Current Amperes | 25 | 50 | 100 | 200 |
| * | Full Scale (KW) | 10 | 20 | 40 | 80 |
| * | Multiplier | 10 | 20 | 40 | 80 |
| | Scale | 1000 watts and 1.0 KW on all ratings | | | |

3-Element for use on 3-phase 4-wire Y service

| | | | | | |
|---|---|---|---|---|---|
| | Voltages | 120, 240, 277, 345 volts | | | |
| | Max. Current Amperes | 25 | 50 | 100 | 200 |
| * | Full Scale (KW) | 9 | 18 | 36 | 72 |
| * | Multiplier | 7.5 | 15 | 30 | 60 |
| | Scale | 1200 watts and 1.2 KW on all ratings | | | |

\# Maximum Current of P base meters is 100 amperes

<u>Types WYP, WYS and WYF (transformer type)</u>

2-element for use on 3-phase 3-wire and Network Service

| | | | | | |
|---|---|---|---|---|---|
| | Voltages | 120, 240, 277, 345, 480 and 600 volts | | | |
| | Max. Current Amperes | 5 | 8 | 10 | 16 |
| * | Full Scale (KW) | 1 | 1.5 | 2 | 3 |
| * | Multiplier | 1 | 1 | 2 or 1 | 2 |
| | Scale | 1000 watts and 1.0 KW on 5 and 10 amp. meter<br>2000 watts and 2.0 KW on 10 amp. meter<br>1500 watts and 1.5 KW on 8 and 16 amp. meters | | | |

2 1/2-element Y for use on 3-phase 4-wire Y service

| | | | | |
|---|---|---|---|---|
| | Voltages | 120, 240, 277 and 345 volts | | |
| | Max. Current Amperes | 6 | 8 | |
| * | Full Scale (KW) | 2 | 3 | |
| * | Multiplier | 2 or 1 | 2 | |
| | Scale | 1000, 2000 watts, 1.0 and 2.0 (KW on 6 amp. meter)<br>1500 watts and 1.5 KW on 8 amp. meter | | |

2 1/2-element delta for use on 3-phase 4-wire delta service

| | | |
|---|---|---|
| | Voltage | 240 |
| | Max. Current Amperes | 8 |
| * | Full Scale (KW) | 3 |
| * | Multiplier | 2 |
| | Scale | 1500 watts and 1.5 KW |

3-element for use on 3-phase 4-wire Y

| | | |
|---|---|---|
| Voltages | 120, 240, 277 and 345 volts | |
| Max. Current Amperes | 6 | 8 |
| Full Scale (KW) | 2 | 3 |
| Multiplier | 1,2 | 2 |
| Scale | 1000 and 2000 watts or 1.0 and 2.0 KW for 6 amp. meter<br>1500 watts and 1.5 KW for 8 amp. meter | |

Frequency 50 hz and 60 hz (all types and ratings)
Indication (all ratings) 90% in 15 minutes, 99% in 30 minutes
Potential coil burden (each coil at 120 volts 60 hz)

| | |
|---|---|
| 2-element 2 1/2-element Y and 2 1/2-element delta | 0.6w, 0.7 rva, 0.9 va |
| 3-element Y | 0.4w, 0.7 rva, 0.8 va |

Current coil burden (each coil of 8 amp. meter) at 5 amp. 60 hz

| | |
|---|---|
| 2-element | 1.1 w, 0.2 rva, 1.1 va |
| 2 1/2-element Y (coil A&C) | 0.4 w, 0.1 rva, 0.4 va |
| (coil B) | 0.5 w, 0.1 rva, 0.5 va |
| 2 1/2-element delta (coil A) | 1.1 w, 0.2 rva, 1.1 va |
| (coil B&C) | 0.4 w, 0.1 rva, 0.4 va |
| 3-element Y | 0.7 w, 0.1 rva, 0.7 va |

* Full Scale value and Multiplier are given for 120 volts, except on the 2 1/2-element delta where the voltage is 240. For other voltages multiply by the voltage ratio (for 277 volts use 2.5).

## Description

This is a reissue of circular E-63 to include 3-element meters and additional transformer type ratings.

The thermal element in the type "WY-" polyphase thermal KW demand meter is based on the design presently used in the demand section of the type "TJ", modified to suit the polyphase application.

The two matched bimetal helices are connected together on a common shaft, each coil mounted in a high temperature moulded phenolic case and fixed rigidly in its separate compartment of the aluminum die cast thermal element. This arrangement provides a thermally symmetrical stable element. The same type of bimetal is used in all elements, and in each of the moulded cases the two heaters are assembled into a thin stainless steel pancake.

The zero adjustment to the right of the element and the full load adjustment to the left of the element apply a corrective force to the bimetal coils through a helical spring. The range of the zero adjustment is ±3% while the full load adjustment has a range of approximately ±10%. In conjunction with the full load adjustment is a helical bimetal temperature compensator. The bimetal is the same material on the "TJ" thermal element compensator and provides approximately 3 1/2% compensation.

The adjustment springs of the "red" pointer are connected to a thin stainless steel band which works over a drum providing linear action and reducing the friction in the movement.

Toroidal current transformers are used throughout the entire family of meters and are manufactured of the highest grade of grain oriented steel.

On self-contained meters the toroidal current transformers are now mounted on the current coils using heat shrinkable cross linked polyethylene tubing over anchor washers. See illustration on E-64-1.

The potential transformers are miniature type using grain oriented silicon steel with moulded primary coils to improve the insulation level.

All KW demand elements have eight heaters, four for each electrical element. Two heaters are on each side of each bimetal coil, one heater for each electrical element, and are connected so that regardless of the location of the bimetal coil there is uniform heat flow minimizing the necessity of any balance shunts.

The electrical circuits are the same as those presently used in the ED-30 and the WD-4.

Also covered by this approval are the addition of a ground lug on all "P" base meters and the enlargement of the potential terminal hole to accommodate two #12 wires on transformer type "P" base meters. The auxiliary wiring panel on the left hand side of the thermal element casting has been replaced by a panel mounted behind the dial plate.

NOTE: The test links as shown in the illustration of the type WYS are incorrect. In production, the links will be connected to the blades.

Approval granted to:

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