DEPARTMENT OF TRADE AND COMMERCE

**STANDARDS BRANCH**

**E-21**

OTTAWA May 20, 1966

# NOTICE OF APPROVAL

FOR

CANADIAN GENERAL ELECTRIC TYPES "VA-63A" and "VA-63S" 2-ELEMENT AND "VA-65A" and "VA-65S" 2½-ELEMENT Y POLYPHASE VARHOUR METERS

## Apparatus

### 2-Element

| | | | | | |
|---|---|---|---|---|---|
| Current Range | 0.12-10 amperes | | | | |
| Voltages | 120 | 240 | 345 | 480 | 600 |
| Varhour disc constant (Kh) | 1.2 | 2.4 | 3.6 | 4.8 | 6.0 |
| (1) Single Phase - (2) Watthour disc constant | 0.693 | 1.386 | 2.079 | 2.771 | 3.464 |
| Test constant | .577 for all ratings | | | | |
| Register ratio - 4 dial x 1 with test dial | 166-2/3 | 83-1/3 | 55-5/9 | 41-2/3 | 33-1/3 |

### 2½-Element Y

| | |
|---|---|
| Current Range | 0.12-10 amperes |
| Voltage | 208 |
| Varhour disc constant (Kh) | 1.8 |
| (1) Single Phase - (3) Watthour disc constant | 3.12 |
| Register Test Constant | 1.732 |
| Register Ratio 4 & 5 dial x 1 with test dial | 111-1/9 |
| Frequency | 60 Hz all ratings |
| Detent | Approved with and without, all ratings |

1. The single phase watthour disc constant marked on the nameplate is the value to be used when verifying these meters on single phase.

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CANADIAN GENERAL ELECTRIC TYPES "VA-63" and "VA-63S" 2-ELEMENT
AND "VA-65A" and "VA-65S" 2½-ELEMENT Y POLYPHASE VARHOUR METERS

2. The single phase test constant marked on the nameplates of the type VA-63 as "Amp. x 0.577" is to be used for two purposes when verifying this type -

(1) As a multiplier for the prescribed test currents. For example, if one of the prescribed test currents is 5 amperes, the single phase test current that is to be applied to produce a torque equivalent to that of a watthour meter of the same rating would be 5 x 0.577 or 2.89 amperes.

(2) As a multiplier to be applied to the register reading when dial-testing on single phase. The register ratio (Rr) matches the disc revolutions in varhours, and therefore when testing on single phase wher e the disc constant has been converted to watthours, it is necessary to apply this multiplier to the register reading as follows - one revolution of the test dial is equivalent to 1 kilovarhour so that the rotating standard will record during that time 1000 x 0.577 or 577 watthours.

3. The register test constant of 1.732 is not marked on the nameplate of the type VA-65. It is the ratio between the single phase disc constant of 3.12 and the polyphase varhour constant of 1.8.

As in the case of the VA-63, the register ratio matches the disc revolutions in varhours, so that when testing on single phase where the disc constant has been converted to watthours, one revolution of the test dial or 1 kilovarhour requires that the rotating standard record during that time 1000 x 1.732 or 1732 watthours.

## Description

The types VA-63 and VA-65 kilovarhour meters are basically the same as the types V-63 and V-65 watthour meters respectively.

The type VA-63 differs from the type V-63 in that it has two separate current coils on each electromagnet, one having twice the number of turns of the other and in having the two electromagnets cross-connected.

The type VA-65 is similar to the type V-65 in that it also has a split coil for "B" current, but differs in that the voltage coils are wound for 208 volts and are intended to be connected in service "line-to-line".

Verification of the type VA-65 will be done with 208 volts applied to both meter and standard.

When verifying the two element VA-63 on single phase, because of the direction in which the current coils are wound, it will be necessary to reverse the connections to the voltage coil of the right-hand element in order to produce forward rotation of the disc.

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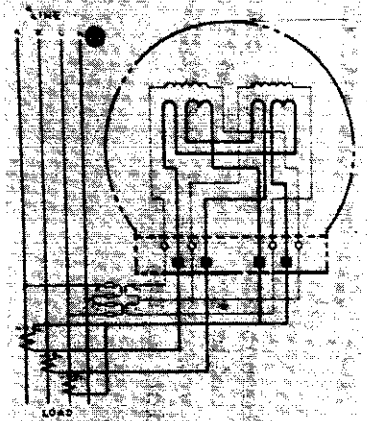
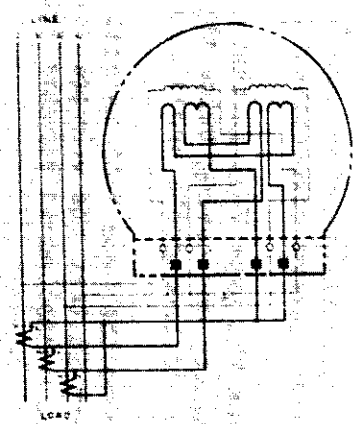
# CANADIAN GENERAL ELECTRIC TYPES "VA-63" and "VA-63S" 2-ELEMENT AND "VA-65A" and "VA-65S" a⅔-ELEMENT Y POLYPHASE VARHOUR METERS

CANADIAN GENERAL ELECTRIC COMPANY LIMITED — **CONNECTION DIAGRAMS** — **53-150742**

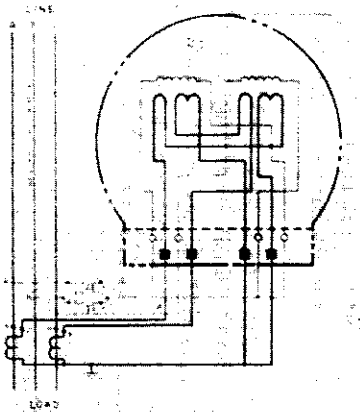
M. CROSS REF. 53-100-58



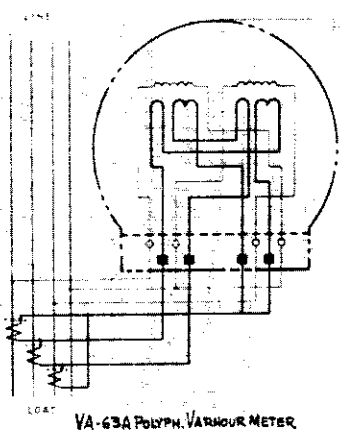
VA-63A POLYPH. VARHOUR METER
4 WIRE Y 3PH. WITH CURR & POT. TRANS.
(PHASE SEQUENCE A-B-C-N)



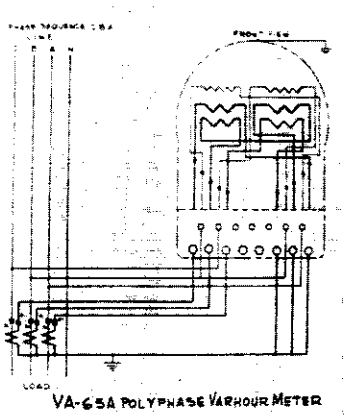
VA-63A POLYPH. VARHOUR METER
4 WIRE Y 3PH. WITH CURR. TRANS.
(PHASE SEQUENCE C-B-A-N)



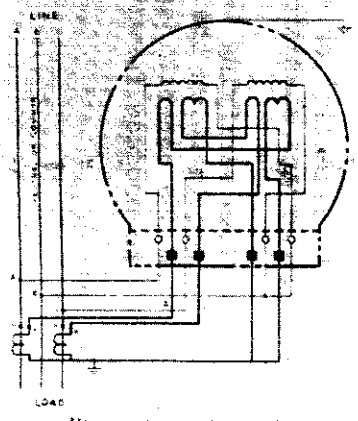
VA-63A POLYPH. VARHOUR METER
3 WIRE Δ 3PH. WITH CURR. TRANS.
(PHASE SEQUENCE A-B-C)



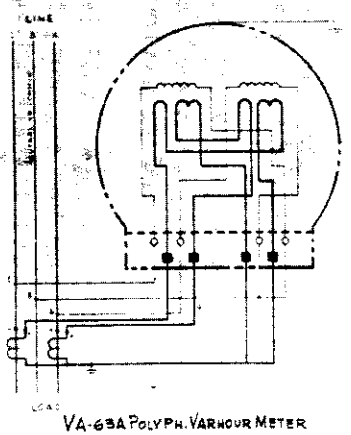
VA-63A POLYPH. VARHOUR METER
4 WIRE Y 3PH. WITH CURR. TRANS.
(PHASE SEQUENCE A-B-C-N)



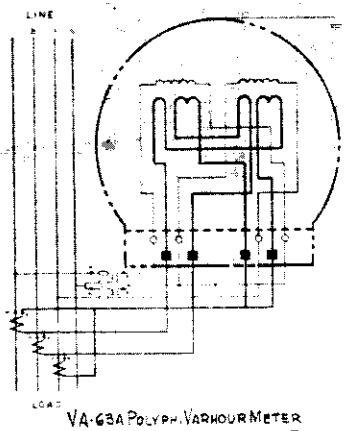
VA-65A POLYPHASE VARHOUR METER
4 WIRE Y 3 PHASE WITH CURR. TRANS.
(PHASE SEQUENCE A-B-C)



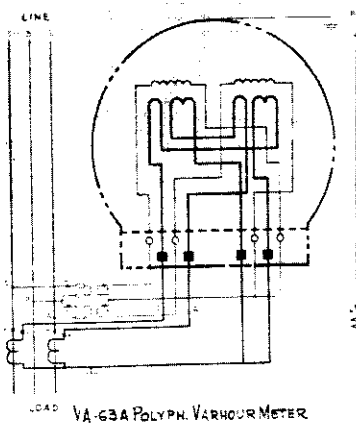
VA-63 A POLYPH. VARHOUR METER
3 WIRE Δ 3PH. WITH CURR. TRANS.
(PHASE SEQUENCE A-B-C)



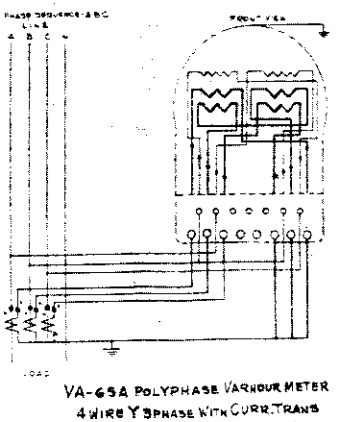
VA-63A POLYPH. VARHOUR METER
3 WIRE Δ 3PH. WITH CURR. TRANS.
(PHASE SEQUENCE C-B-A)



VA-63A POLYPH. VARHOUR METER
4 WIRE Y 3PH. WITH CURR & POT. TRANS.
(PHASE SEQUENCE C-B-A-N)



VA-63A POLYPH. VARHOUR METER
3 WIRE Δ 3PH. WITH CURR & POT. TRANS.
(PHASE SEQUENCE C-B-A)



VA-65A POLYPHASE VARHOUR METER
4 WIRE Y 3PHASE WITH CURR. TRANS
(PHASE SEQUENCE A-B-C)

ROUTE: 12

DRAWN BY / ISSUED BY — MAR. 29/66 — C I P D DEP'T QUEBEC WORKS — **53-150742**

The type VA-63 may be used to meter the reactive energy in a 3-phase 4-wire Y circuit if the current coils are 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.

As these warhour meters will measure correctly the reactive energy in a circuit only when connections are made in accordance with phase rotation, the Company has prepared and will include with every varhour meter shipped, a print showing the correct connections for various applications.

This print is reproduced on this circular. A more complete description of the operation of these varhour meters will be found in Technical Bulletin No. 7.

Some type VA-63 varhourmeters may be encountered which do not have the single phase test constant "Amp. x 0.577" marked on their nameplates.

These meters are to be treated no differently from those that have nameplates on which this marking appears.

Approval granted to: The Canadian General Electric Company Limited,
1130 Boulevard Charest,
Quebec 8, Que.

J.R. Gardiner
for W.J.S. Fraser,
Chief, Standards Laboratory,
Standards Branch.

K. Cryer
K. Cryer,
Chief, Electricity & Gas Division,
Standards Branch.

Ref: SL-100-801Q