DEPARTMENT OF

TRADE AND COMMERCE
CANADA

SD-EA.231

STANDARDS DIVISION

OTTAWA, February 28, 1956.

TYPE APPROVAL

A. S. E. A. VOLTAGE TRANSFORMERS, TYPE EMFA

The apparatus specified 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: Type EMFA Voltage Transformers, manufactured by Allmanna Svenska Elektriska Aktiebolaget (i.e. Swedish General Electric Limited), Sweden, and distributed in Canada by the Swedish General Electric Limited, 6 Church Street, Toronto 1, Ontario.

Rating of Apparatus:

Primary Voltage	$115,000/\sqrt{3}$	EMFA 120
	$46,000/\sqrt{3}$	EMFA 60
	$27,000/\sqrt{3}$	EMFA 40
Secondary Voltages	$115/\sqrt{3}$, $115/\sqrt{3}$	
Rated Burden	200 VA at 0.85 p.f.	
Accuracy Rating	0.6Z *	
Frequency	60 cycles	

* Shown on nameplate.

Description: When designing the type EMFA voltage transformer, the manufacturer had the following requirements in mind:

(1) that it should meet certain specified requirements for surge-proof insulation;
(2) that it should be suitable for both metering and earth fault protection;
(3) that it should be small in size;
(4) that it should be hermetically sealed.

The primary winding is intended for connection between phase and earth or neutral in three phase networks, but is also designed to withstand phase to phase voltage for a certain period without damage.

There are two secondary windings: one for metering and one for fault protection.

The fact that one end of the primary winding is always connected to earth permitted reduction of total insulation by graduating from full value in the outer winding down to very light insulation in the inner, earthed, layer. Only one full system voltage bushing is therefore required per phase, the earthed end of the winding being terminated in a small bushing.

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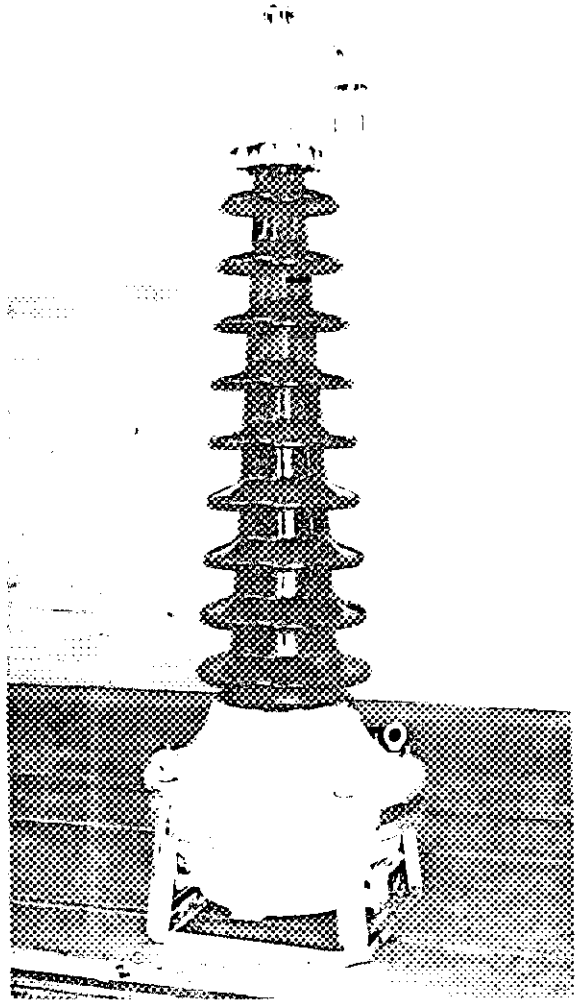
SWEDISH GENERAI ELECTRIC LIMITED (A.S.E.A.)

VOLTAGE TRANSFORMER, TYPE EMFA



The insulation consists of tightly wound, oil-impregnated layers of solid insulating material since cooling is not a problem.

The small size, in conjunction with a fitted casing and sand-filling, made it possible to design an hermetically sealed transformer. The oil quantity is small so that its volume changes due to temperature variations can be compensated by an enclosed cushion of nitrogen gas.

The high voltage winding is a single layer wound coil with the bottom layer at earth potential. The axial length of the layers decreases with increased diameter rather like the layers in a capacitor bushing. The first turn of the bottom layer and the last turn of the outer layer are directly in contact with a slit cylinder of thin copper, one underneath the bottom layer and the other outside the outer layer. These plates form the first and final links in a capacitor chain with the conductors forming intermediate capacitor layers.

The core consists of a central leg through the central opening of the winding and a ring shaped yoke around the more or less spherical winding.

E. F. Power

E. F. Power,
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