•Detalles Constructivos Básicos del Transformador

(Fotos y Trasparencias).

* Núcleo.: Estructuras.
  Material: Acero-Silicio. : Histéresis, μ, ρ, saturación.

* Bobinado.
  Estructura.
  Sección del conductor { ○ / ▭ ; Aislación { Papel. / Algodón. / Cartón. ; Capas.

Núcleo + Bobinado. = Parte Activa.

* Enfriamiento y Aislación { aire. (Baja Potencia y Tensión).
  { aceite aislante.
  Sólidos. (Media Tensión).

Cuba. Tanque de Expansión. Filtro aire (Silicagel).
Sellados.

• Radiadores. Circulación Forzada. ONAN / ONAF / OFAF.

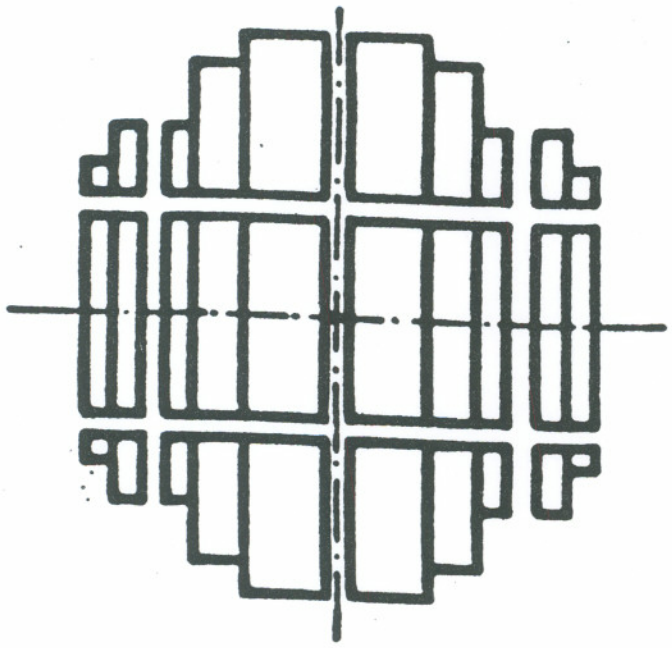
* Montaje: Pasa tapa (bushings).

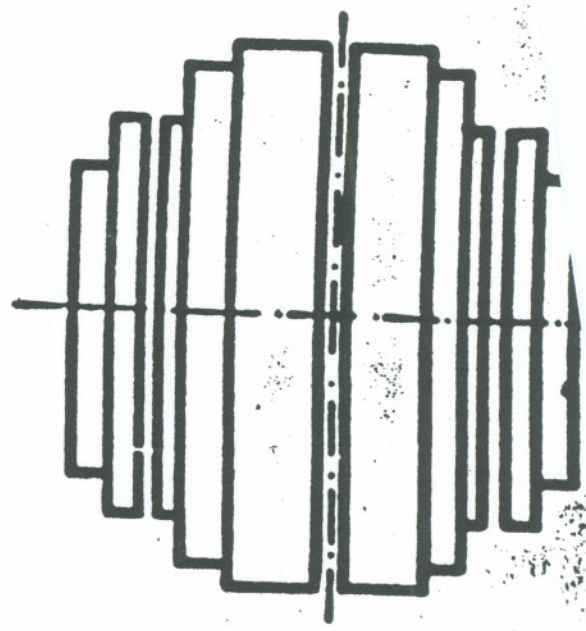
* Conmutadores.

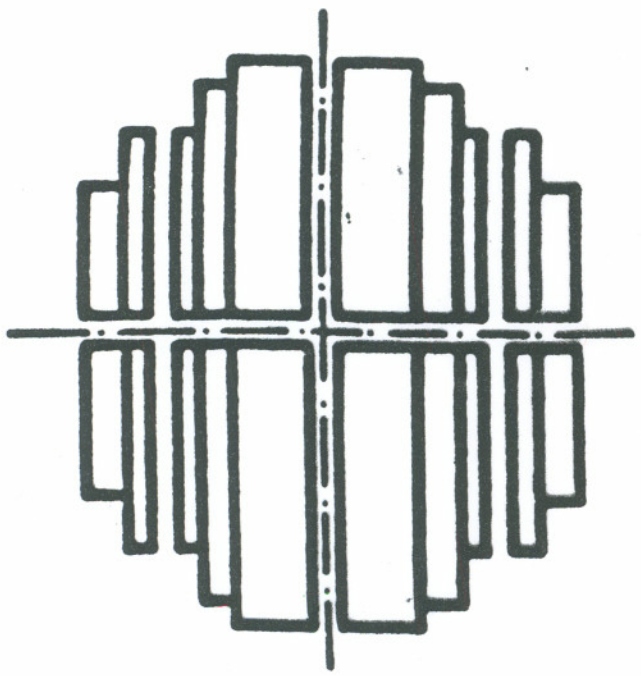
* Protecciones Propias. { Nivel de Aceite.
  { Temperatura de Aceite.
  { Imagen térmica.
  { Rele Boucholtz.
  Corriente de Tierra

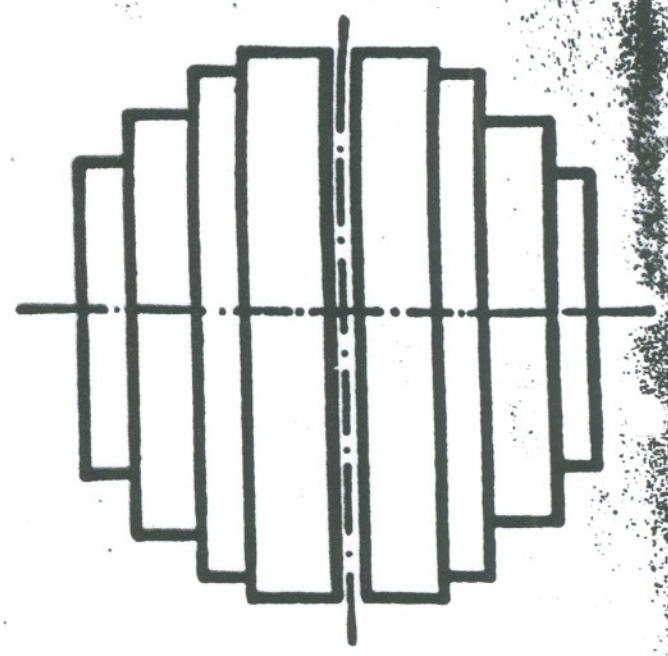
* MANTENIMIENTO S/ ACEITE.

→ Nivel.
→ Humedad (ε↓). Medida de Rigidez.
→ Acidez. (ataca el papel) (Vejez).
→ Gases Disueltos → puntos calientes (Cromatografía).









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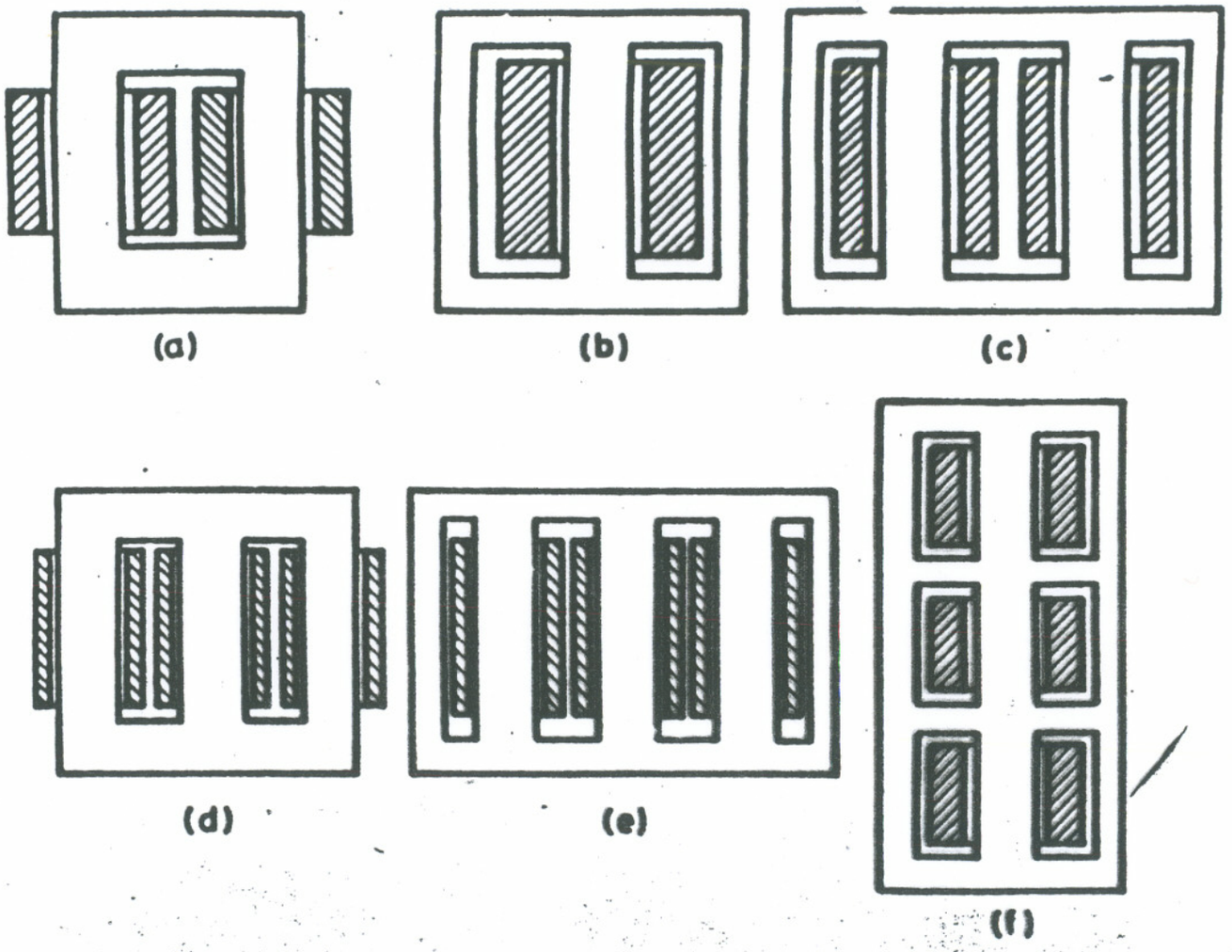
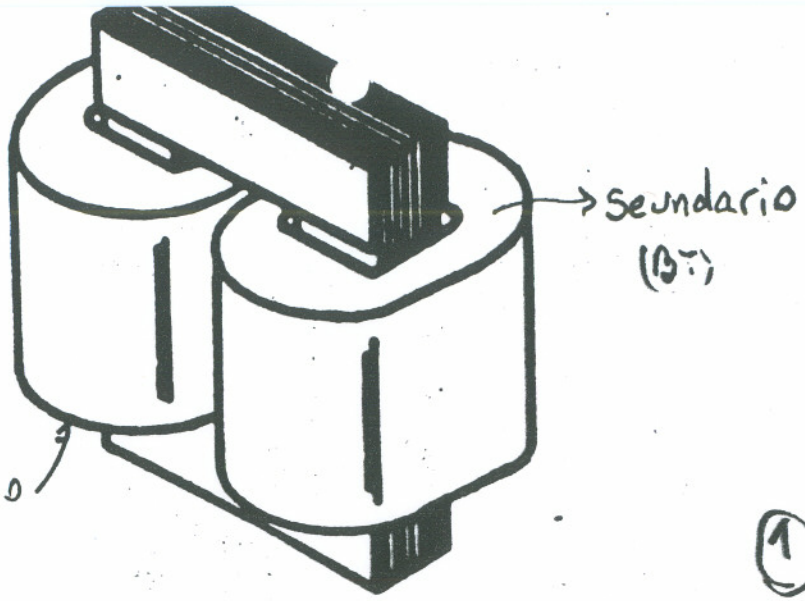
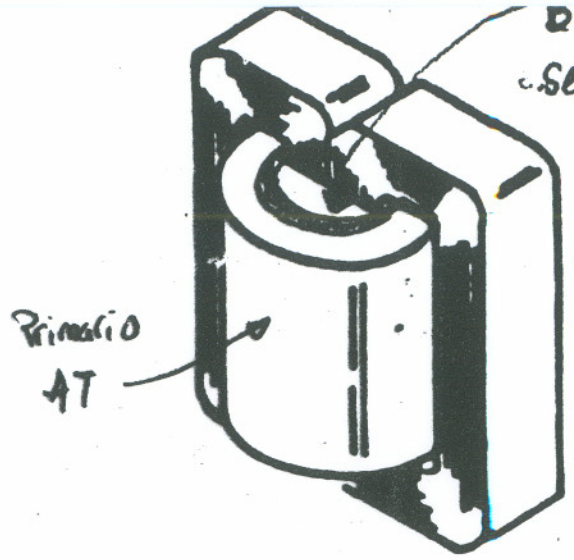


3

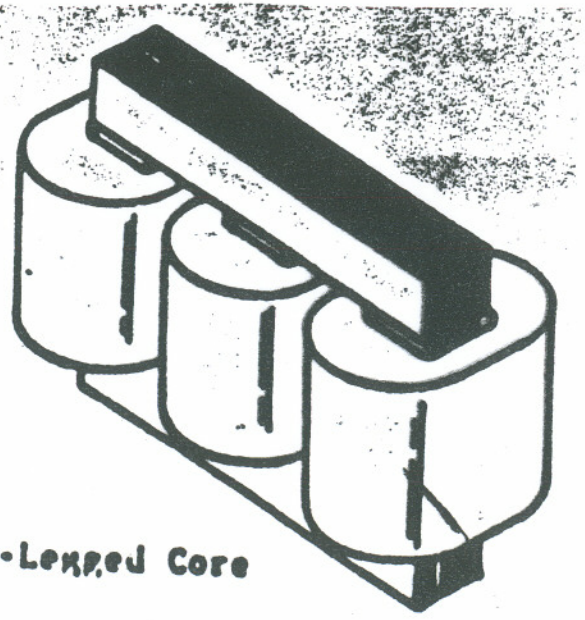
Fig. 2.22. Various core types: (a) single-phase two-limb core-type: (b) single-phase single-limb shell-type; (c) single-phase two-limb shell-type; (d) three-phase core-type; (e) three-phase five-limb core; (f) three-phase shell-type core



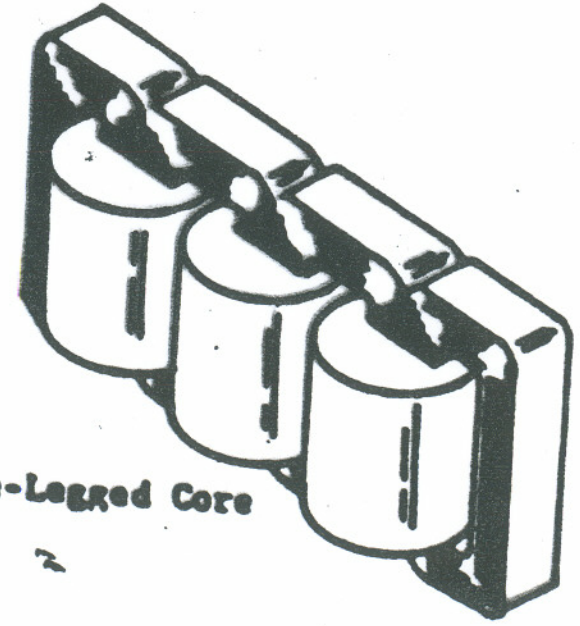
(a) Core Type



(b) Shell Type



(c) Three-Legged Core



(c) Five-Legged Core

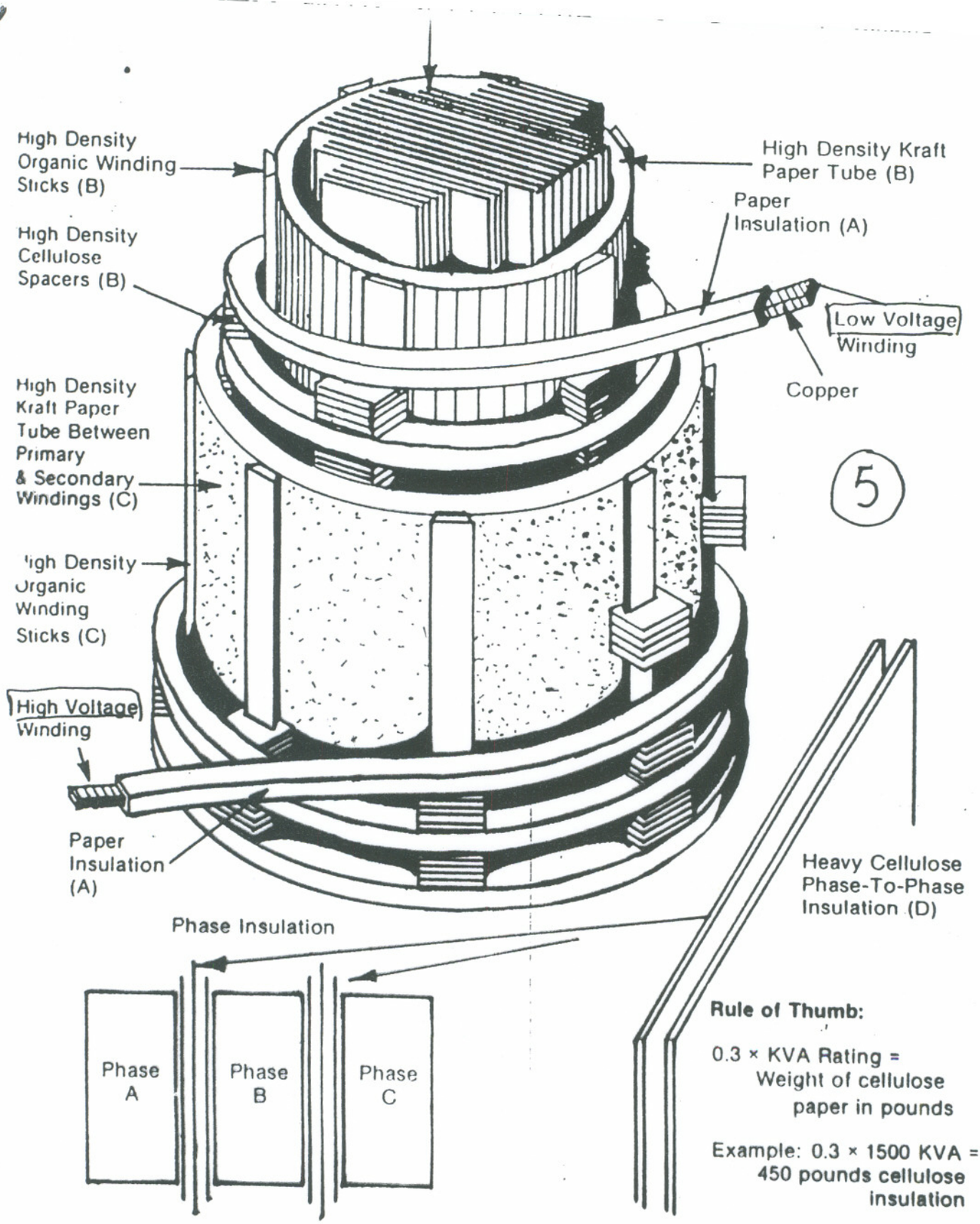
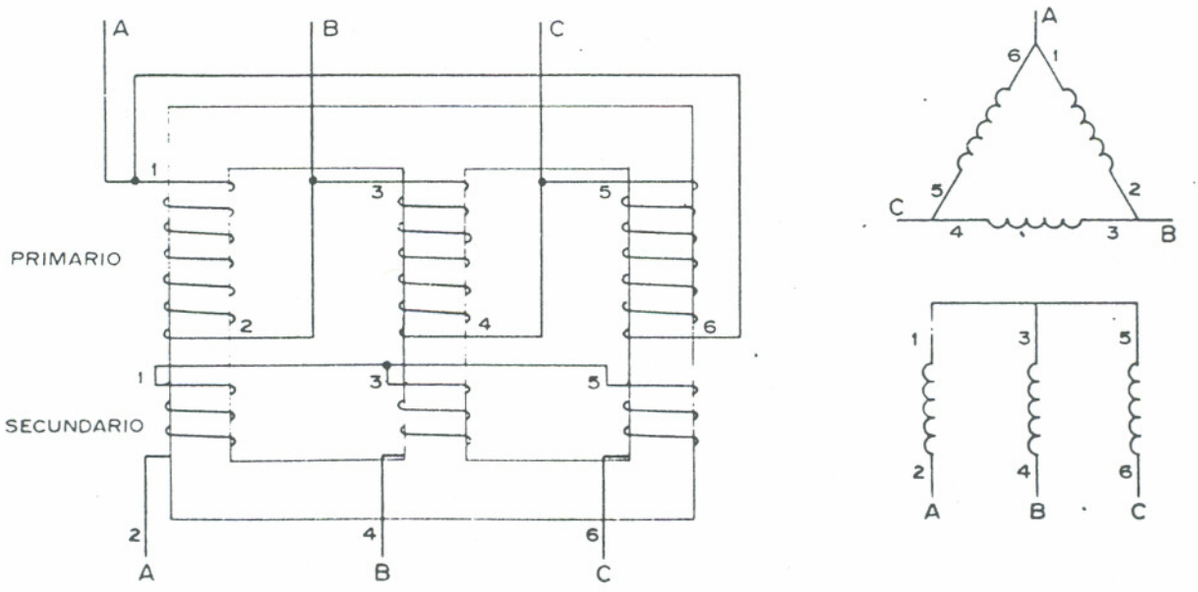
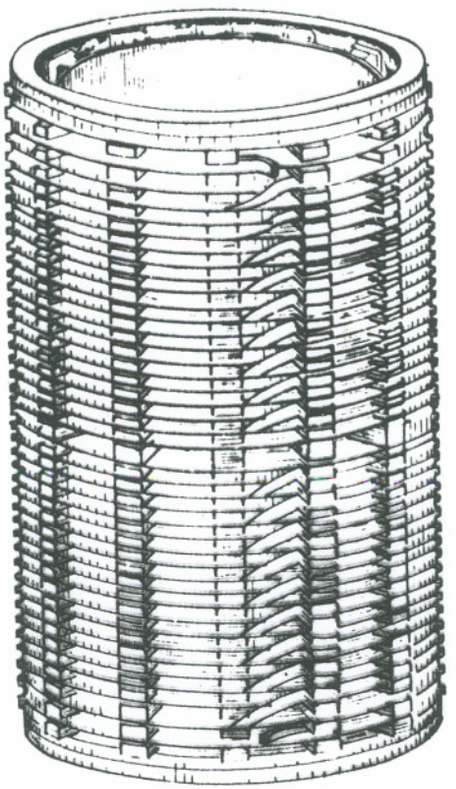


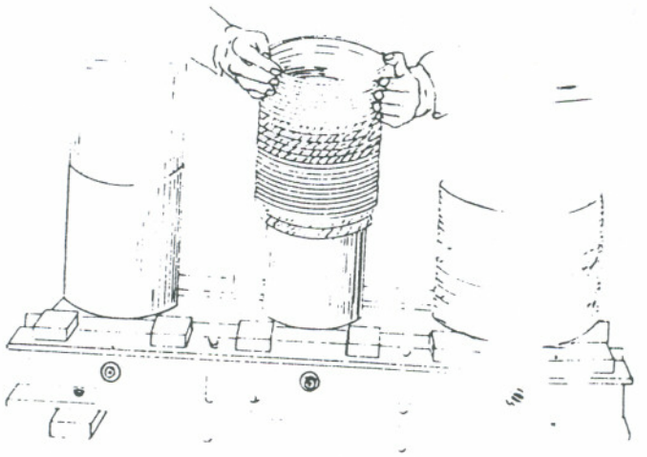
Figure 1.55 - Basic insulation system of a core type power transformer where (A) is insulation on wire (minor); (B) is insulation to ground (major); (C) is insulation between windings (major); and (D) is insulation between phases (phase-to-phase).



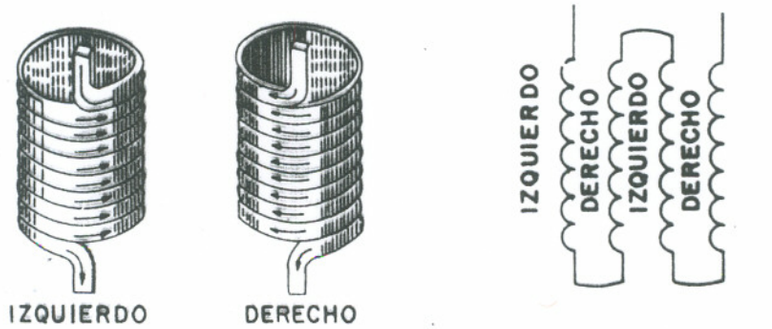
CONEXION DELTA - ESTRELLA
PARA UN TRANSFORMADOR TRIFASICO

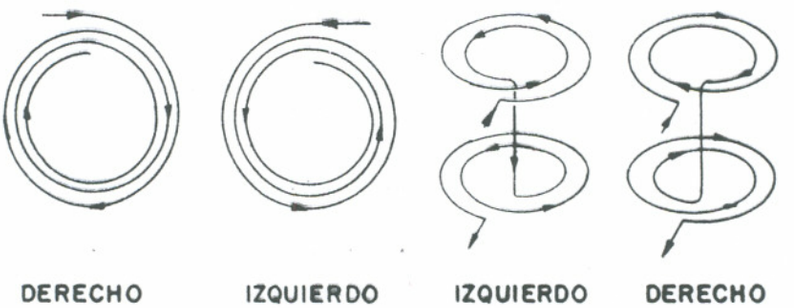


BOBINA DE DISCO CONTINUO
(HELICOIDAL)

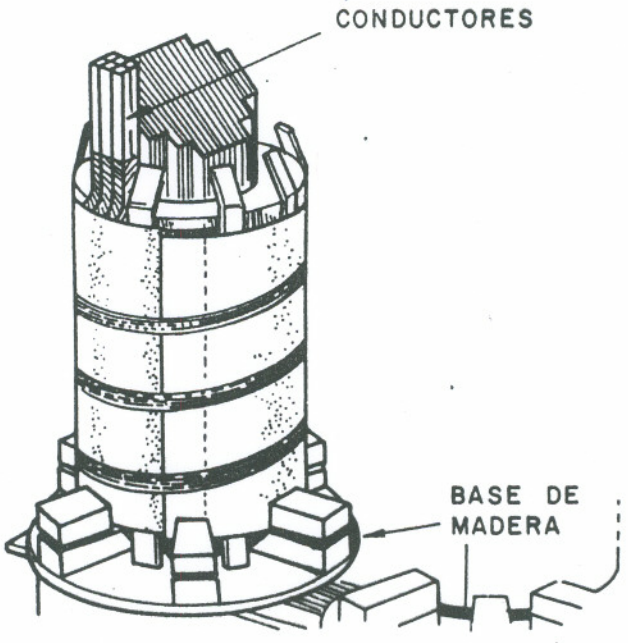


MONTAJE DE LA BOBINA

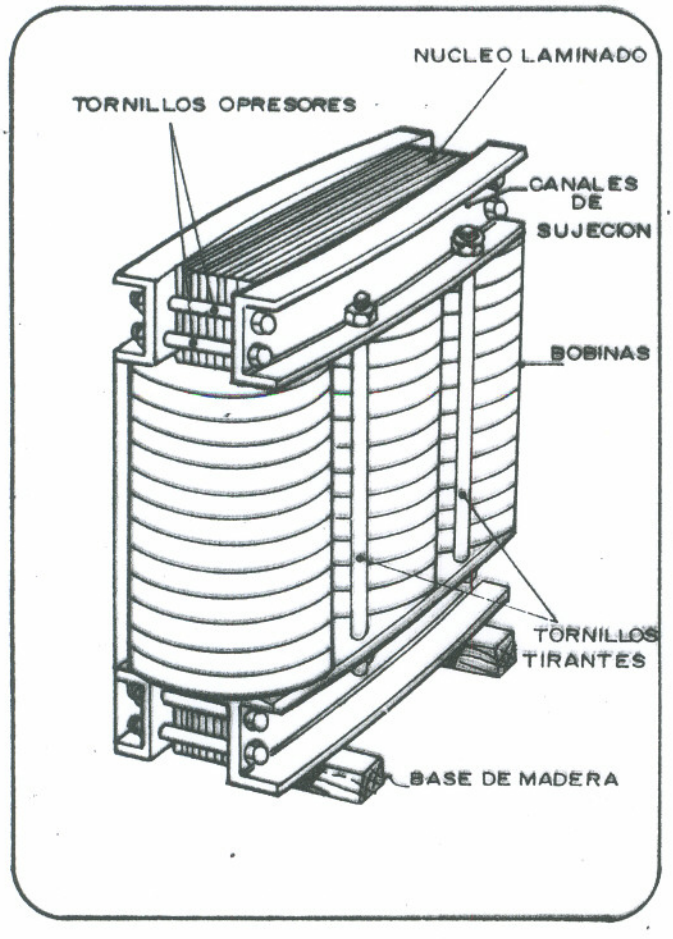




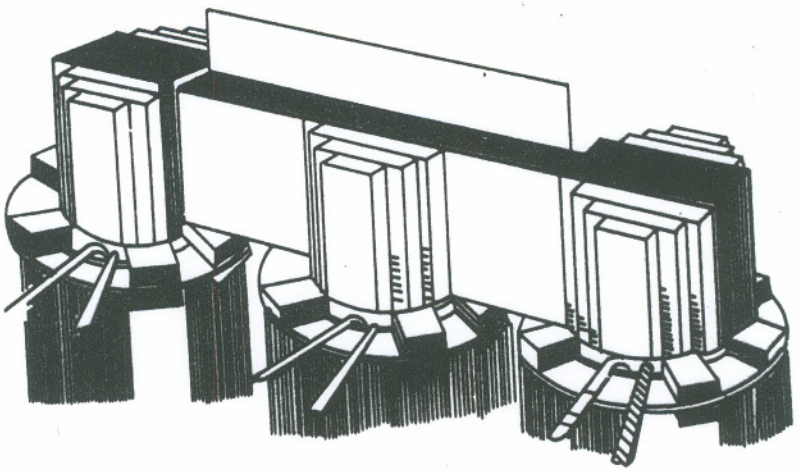
DEVANADOS DERECHO IZQUIERDO



DETALLE DE MONTAJE DE BOBINAS EN LAS PIERNAS DEL TRANSFORMADOR

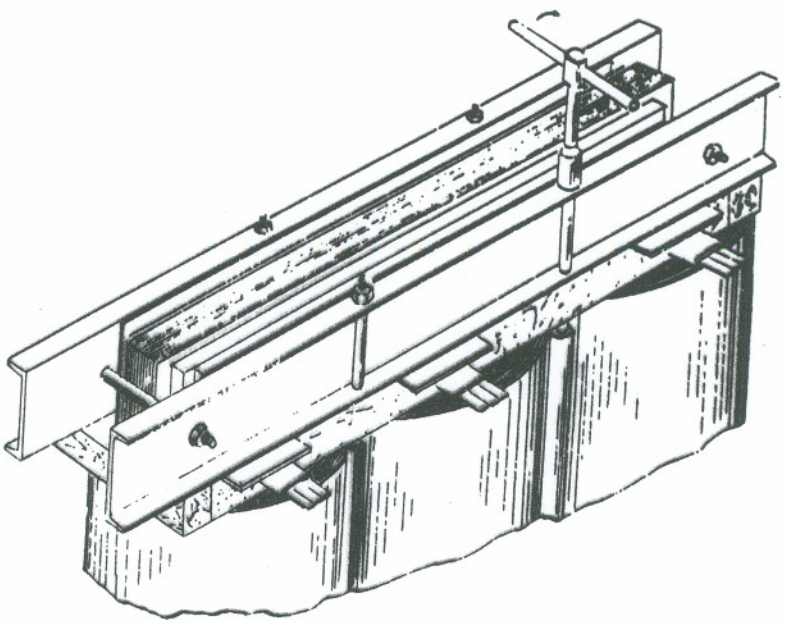


VISTA DEL NUCLEO Y BOBINAS ENSAMBLADAS PARA UN TRANSFORMADOR TRIFASICO



LAMINACION DEL YUGO DESPUES DEL MONTAJE DE BOBINAS

X



FIJACION DE LAS BOBINAS Y EL YUGO SUPERIOR

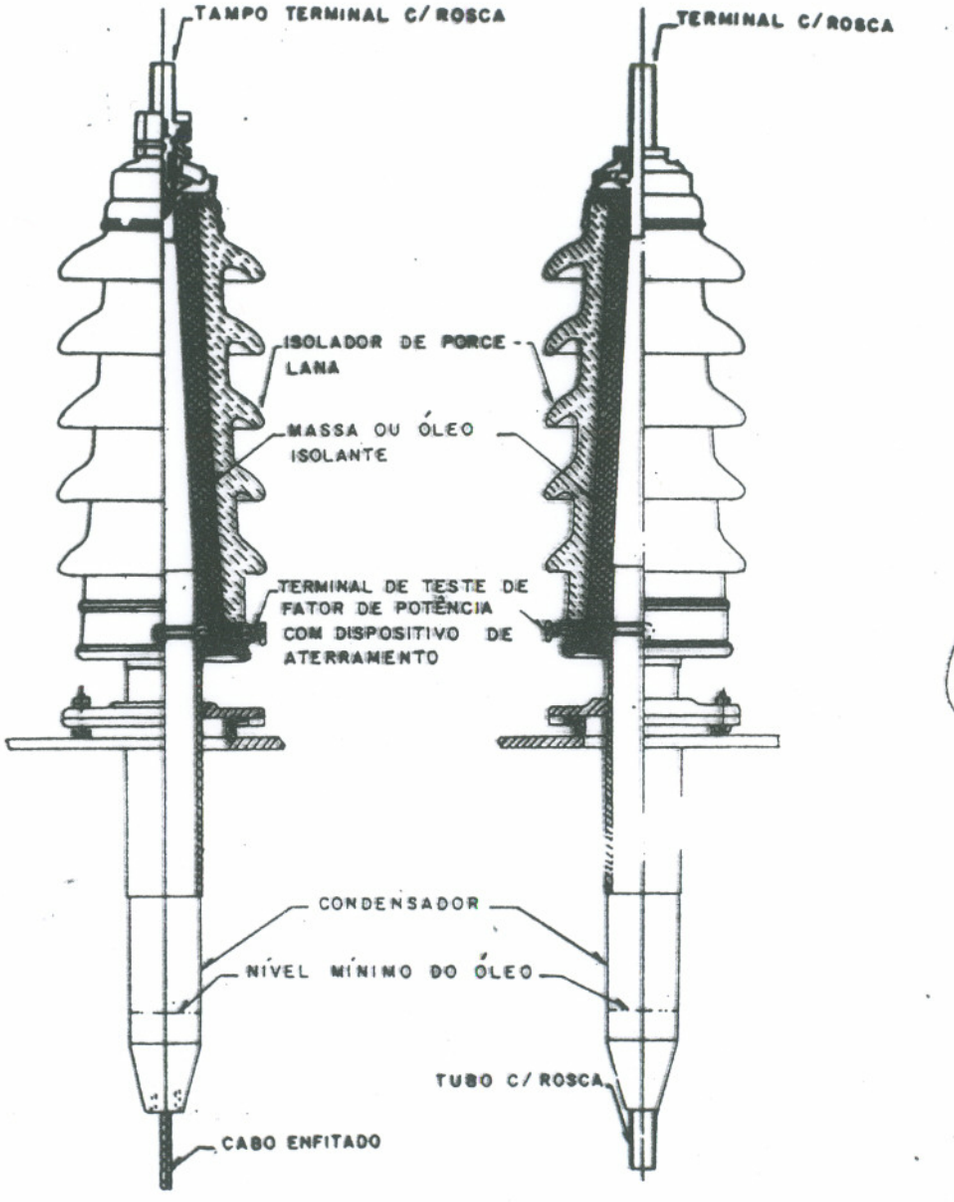
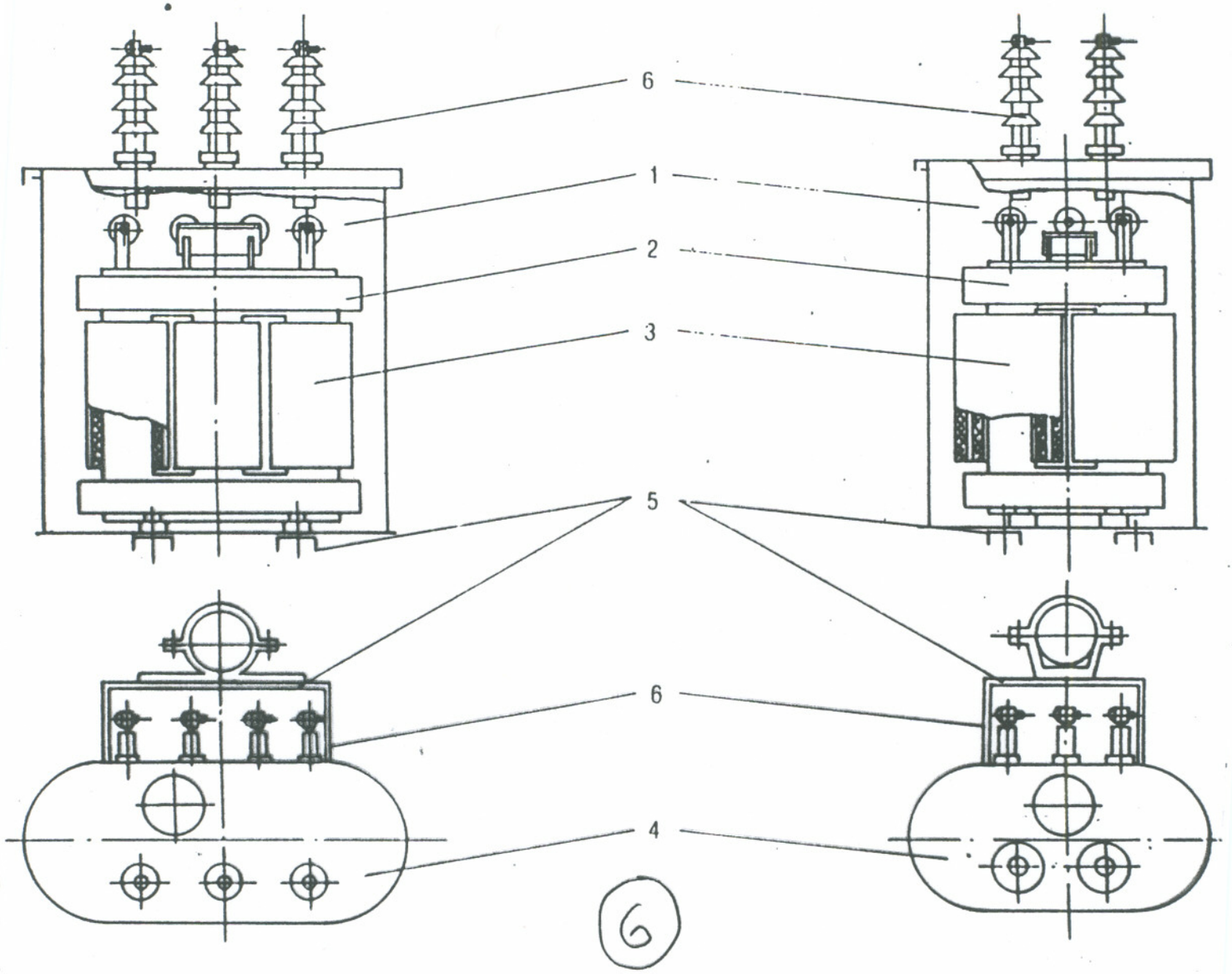


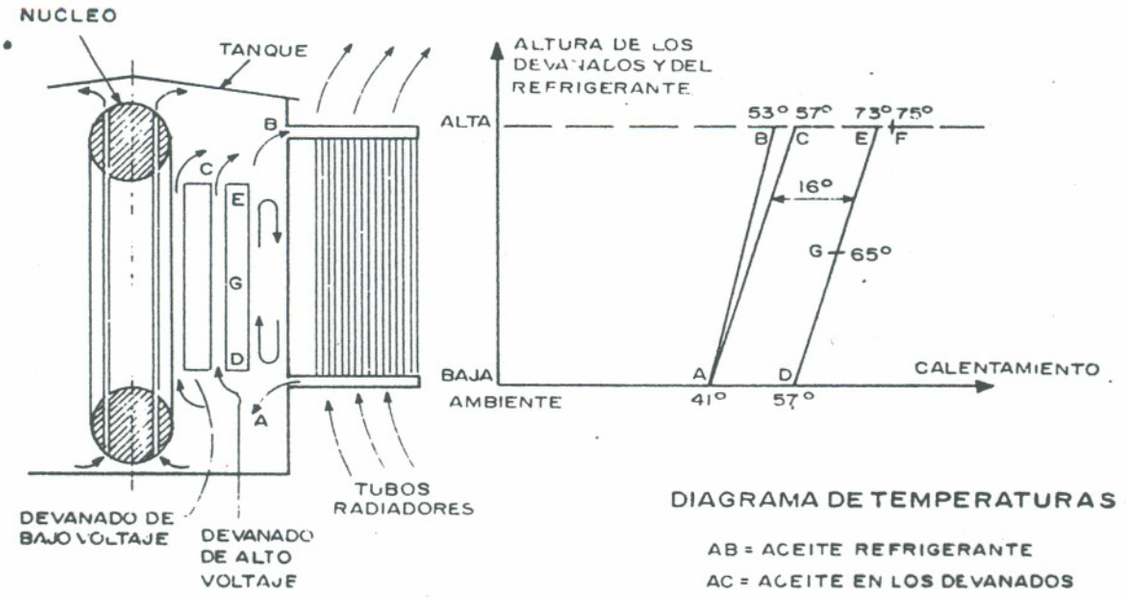
Figura 5.3 — Buchas capacitivas Westinghouse



Trifásico

Monofásico

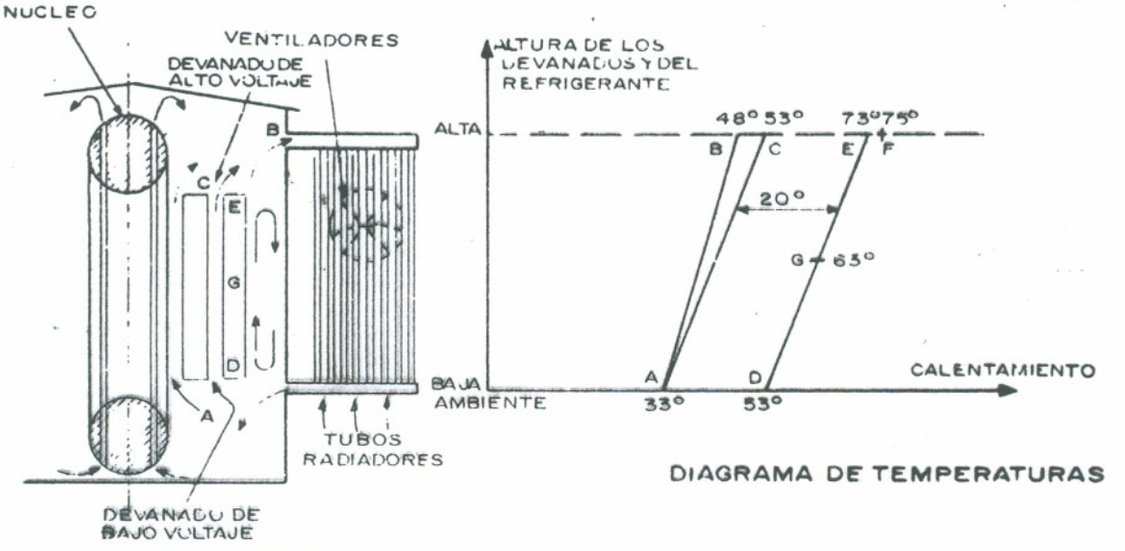
1 — Execução selada
2 — Núcleo de 2 ou 3 colunas tipo convencional empilhado
3 — Bobinas cilíndricas concêntricas
4 — Tanque retangular com laterais menores redondas (ovalado)
5 — Montagem em poste ou plataforma aérea
6 — Buchas AT na tampa e BT na lateral do tanque



CIRCULACION NATURAL DEL ACEITE Y DEL AIRE (O A)

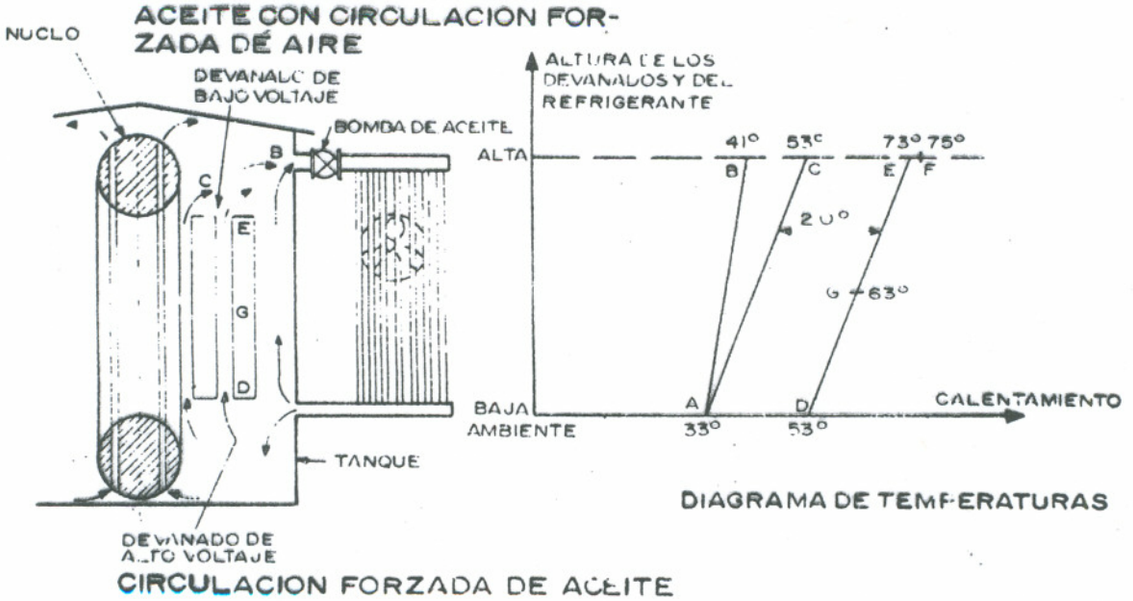
DIAGRAMA DE TEMPERATURAS

AB = ACEITE REFRIGERANTE
AC = ACEITE EN LOS DEVANADOS
DE = EXTRACCION DE LOS DEVANADOS
F = PUNTO CALIENTE
AD = CE = GRADIENTE DE LA CURVA DEL ACEITE
G = CALENTAMIENTO MEDIO DE LA CURVA



CIRCULACION NATURAL DEL ACEITE CON CIRCULACION FORZADA DE AIRE

DIAGRAMA DE TEMPERATURAS



CIRCULACION FORZADA DE ACEITE Y DEL AIRE

DIAGRAMA DE TEMPERATURAS

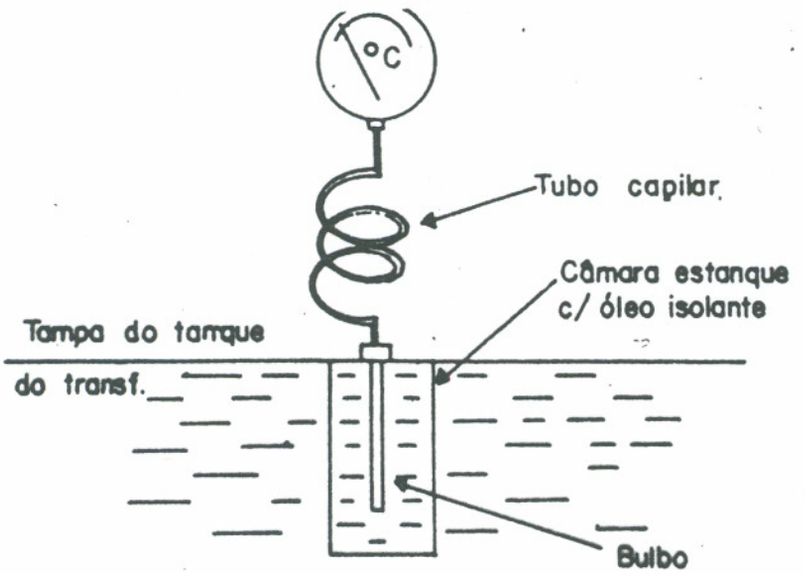


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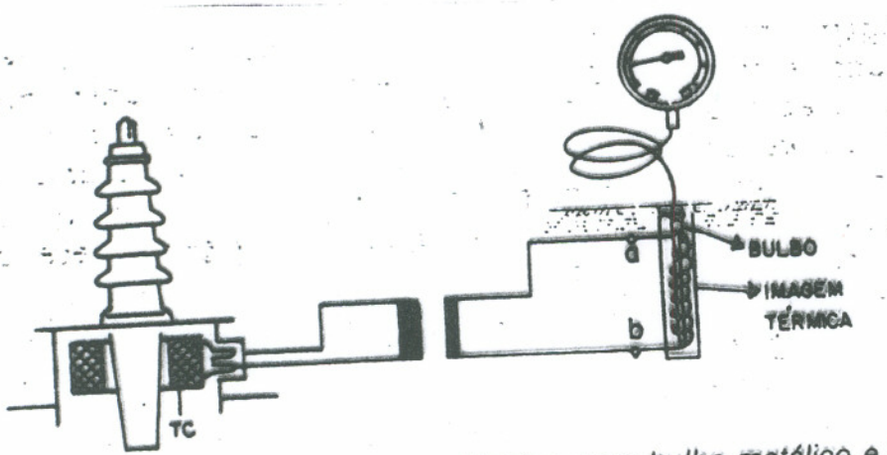
Figura 4.15 — Medidor de temperatura de bulbo



10

f 4.17 — Dispositivo de imagem térmica com bulbo metálico e transformador de corrente de ajuste

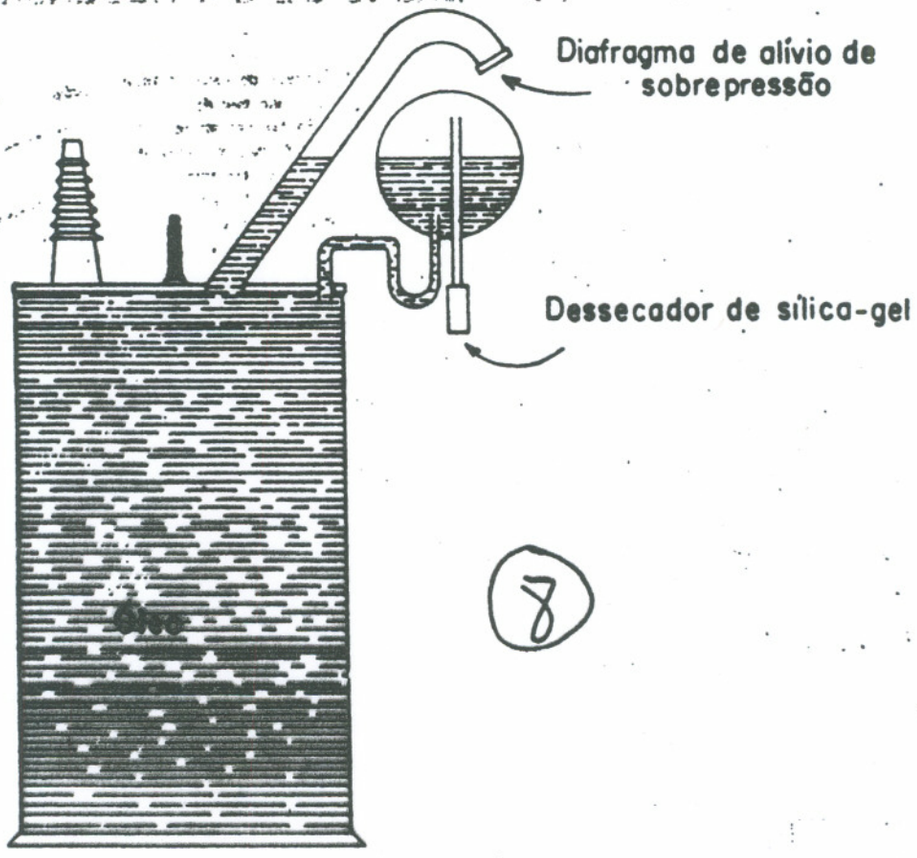
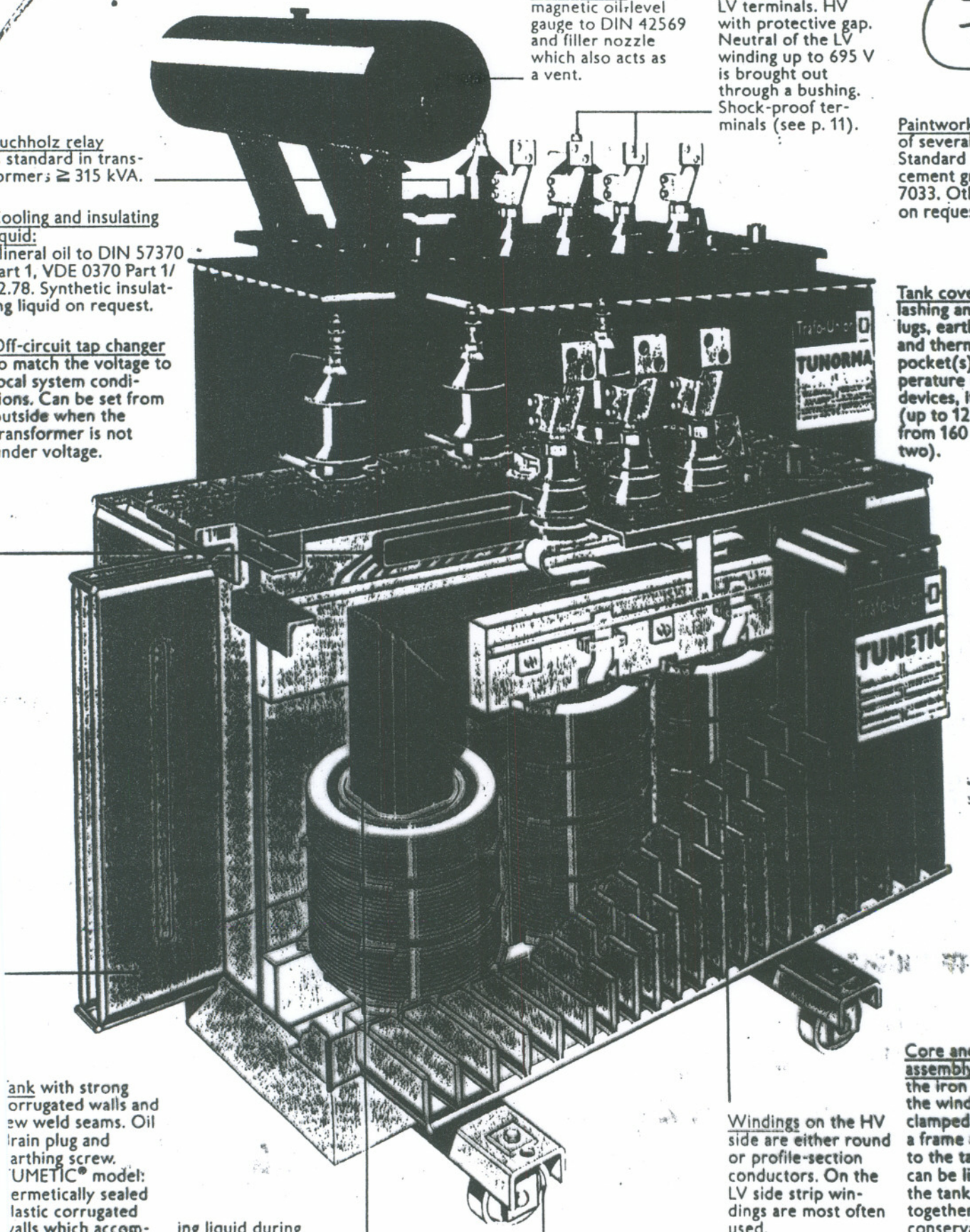


Figura 4.11 — Sistema de preservação do óleo isolante com dessecador de sílica-gel



Conservator with magnetic oil-level gauge to DIN 42569 and filler nozzle which also acts as a vent.

Bushings for HV and LV terminals. HV with protective gap. Neutral of the LV winding up to 695 V is brought out through a bushing. Shock-proof terminals (see p. 11).

Buchholz relay is standard in transformers ≧ 315 kVA.

Cooling and insulating liquid: Mineral oil to DIN 57370 Part 1, VDE 0370 Part 1/12.78. Synthetic insulating liquid on request.

Off-circuit tap changer to match the voltage to local system conditions. Can be set from outside when the transformer is not under voltage.

Paintwork consists of several coatings. Standard colour is cement grey RAL 7033. Other colours on request.

Tank cover with lashing and lifting lugs, earthing screw and thermometer pocket(s) for temperature monitoring devices, if required (up to 125 kVA one, from 160 kVA on two).

ank with strong orrugated walls and ew weld seams. Oil rain plug and arthing screw. UMETIC® model: ermetically sealed lastic corrugated alls which accom- odate reliably to ne variations in the olume of the cool-

ing liquid during operation. Absolutely maintenance-free. The life expectancy corresponds to that of TUNORMA® tank.

Core of low-loss, grain-oriented electric steel laminations insulated on both sides.

Truck with flat-rim wheels, which can be set for forward or sideways movement.

Windings on the HV side are either round or profile-section conductors. On the LV side strip windings are most often used.
Insulation: high dielectric strength and good temperature stability. The windings are braced axially and radially to withstand short-circuit forces.

Core and coil assembly comprising the iron core and the windings clamped together in a frame and bolted to the tank cover. It can be lifted out of the tank complete together with the conservator and bushings.