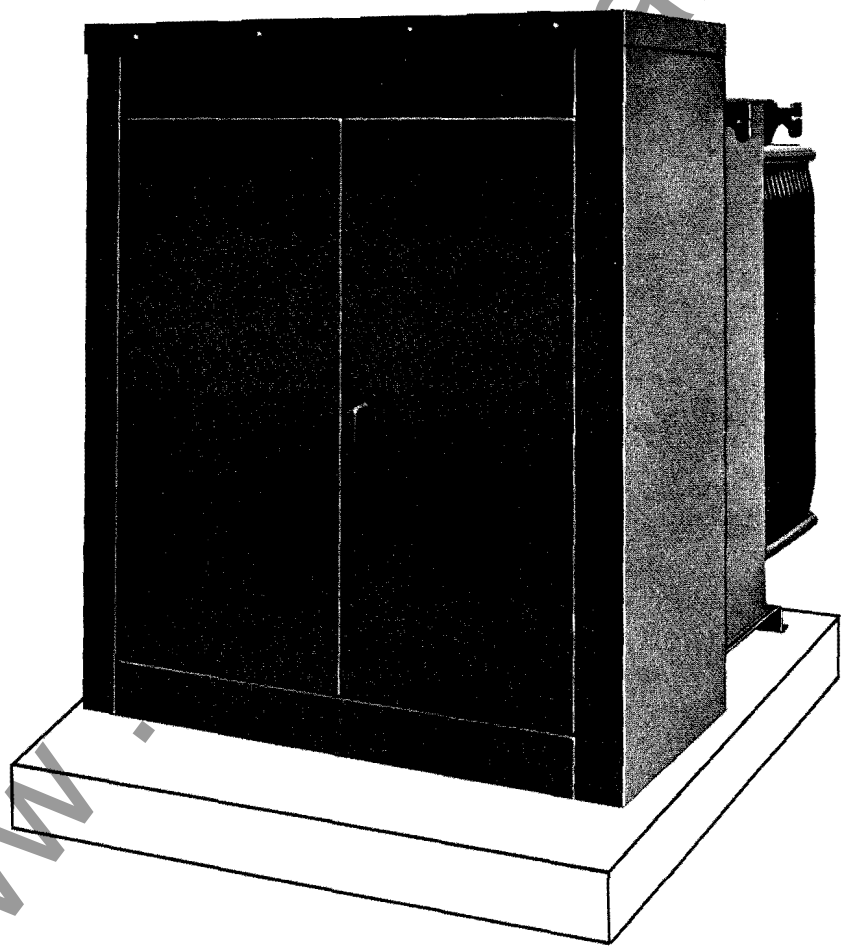
Westinghouse

PLAZAPAD™ Tamperproof Transformers

For Underground Power Distribution

3 Phase, Liquid Immersed
750 Thru 2500 Kva



Application

The Westinghouse Plazapad transformer is ideally suited for underground power distribution to shopping centers, apartment and office buildings, schools, industrial locations and the like without need for unsightly fences or other external protection. Tamperproof construction with no accessible external bolts, hinges, screws or fasteners provides a safe self-contained unit which prevents entry by unauthorized personnel. Available in ratings from 750 KVA to 2500 KVA with delta or wye primary voltages through 34.5 KV. These three phase, self-cooled, liquid immersed transformers are built in accordance with ANSI Standard C57.12.22.

Advantages

The Westinghouse Plazapad features: rectangular core and coil design, pioneered by Westinghouse in 1954 for use where rugged construction is needed for severe service (see pages 4 and 5). A new plant — one of the industry's most fully automated — designed specifically for the building of rectangular core form transformers eliminates many manual operations to insure uniform construction and shorter shipping schedules. The advantage of computer transformer design allows for optimum material mix to lower initial cost, while maintaining high quality standards.

November, 1971
New Information
E.D.C./2091/DB

Features and Accessories

General Design Features
The Westinghouse Plazapad is an outdoor weatherproof pad mounted transformer, mineral oil immersed, rated 65°C rise. Completely factory assembled, it is shipped as one piece, reducing handling and installation costs. The weatherproof housing bolted to one side of the transformer includes high and low voltage compartments featuring a bolted-on compartment cover and a removable door sill to permit easy positioning on the pad. The compartments are separated by a steel barrier bolted into place, the high voltage compartment being accessible only after the low voltage compartment has been opened. Padlockable doors with three point latching feature stainless steel hinge pins and 90 degree door stops. Doors easily lift off to facilitate cable connections. Cooling is accomplished through flat tubular coolers welded to the tank wall. A welded-on tank cover and handhole provides sealed tank oil preservation. Standard tank pressure is 8 PSI. Lifting hooks are provided for lifting the complete unit as well as lifting loops for lifting the tank cover. Provision is made for jacking the unit and the base is suitable for rolling or skidding in any direction. Each unit receives a complete undercoating at the factory. Standard paint is Bell Telephone Green, Munsell No. 7GY2.9/1.5, with other ANSI standard finishes and special finishes available upon request.

High Voltage Compartment
The high voltage compartment houses the high voltage cast resin bushings, two hole ground pad and has provision for lightning arresters with space for stress cones.

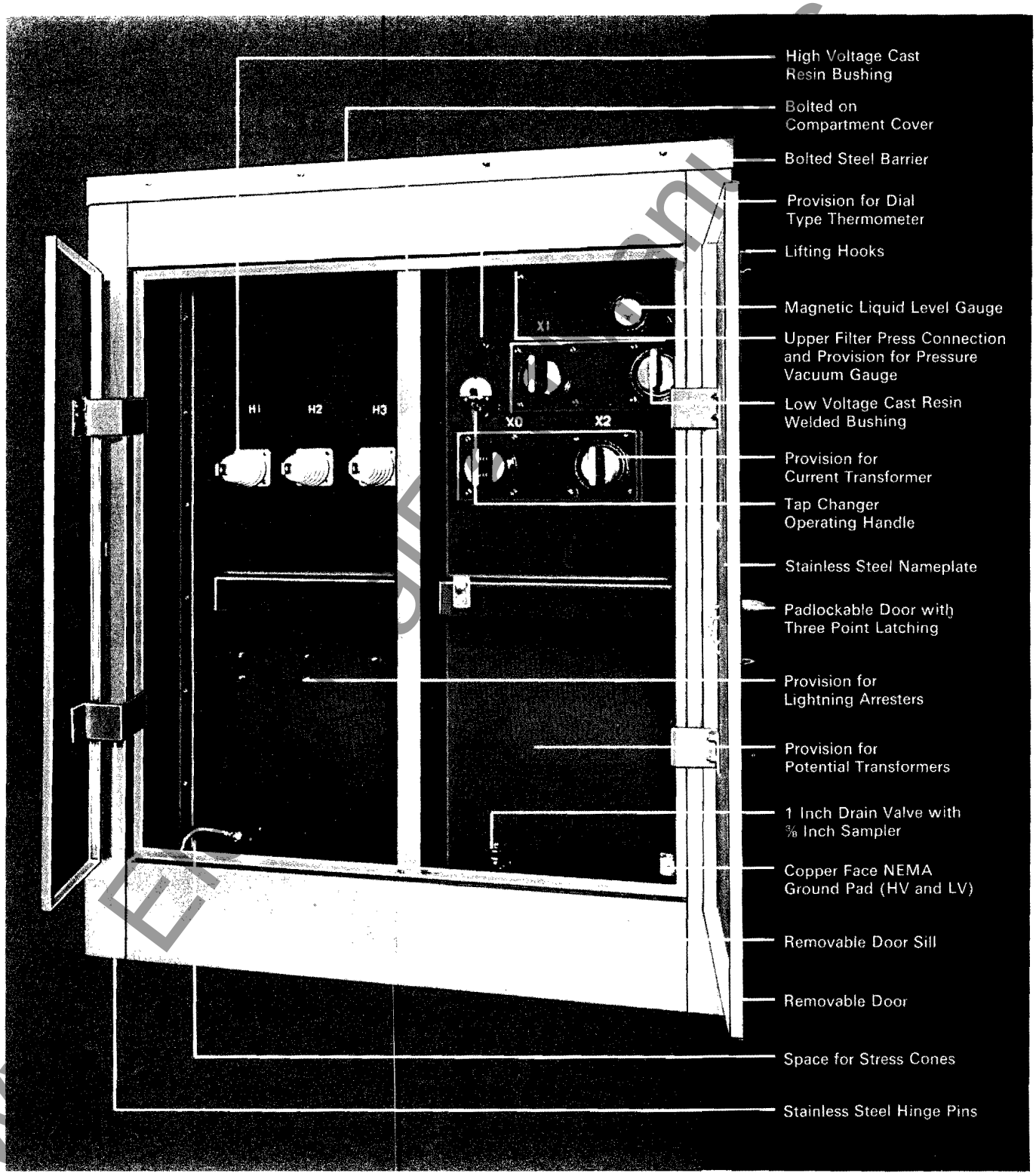
Low Voltage Compartment
The low voltage compartment houses the low voltage cast resin welded bushings, no load tap changer operating handle, magnetic liquid level gauge, one inch drain valve with ⅜ inch sampler, two hole ground pad and upper filter press connection. Provision is made for the addition of a dial type thermometer and pressure vacuum gauge. A stainless steel nameplate is affixed to the inside of the low voltage compartment door.

Electrical Tests
Electrical tests are performed as standard in accordance with ANSI Standard Test Code for transformers.
1. Resistance measurements.
2. Ratio tests.
3. Polarity and phase relation.
4. No load loss.
5. Exciting current.
6. Impedance and load loss.
7. Applied potential test.
8. Induced potential test.
9. Temperature test or tests will be made on one unit only of an order covering one or more units of a given rating. Tests will be made only when there is not available a record of a temperature test, made in accordance with ANSI Standards, on a duplicate or essentially duplicate unit.

Standard Features and Accessories
- Upper filter press connection.
- H.V. cast resin bushing with two hole spade.
- One inch drain valve with ⅜ inch sampler.
- L.V. cast resin welded bushing with six hole spade.
- Magnetic liquid level gauge.
- Padlockable no load tap changer.
- Stainless steel diagramatic nameplate.
- Padlockable door handle with three point latching.
- Copper faced NEMA ground pads in high and low voltage compartments.
- Removable doors with stainless steel hinge pins and 90° door stops.
- Removable door sill.
- Bolted on tamperproof, weatherproof compartment with removable bolted on cover.
- Lifting hooks and loops.
- Bolted steel barrier between high and low voltage compartments.
- Provision for dial type thermometer.
- Provision for pressure vacuum gauge.
- Provision for potential and current transformers.
- Provision for distribution type lightning arresters.
- Space for stress cones.
- Elastimold bushings or bushing wells (available upon request as standard).

Optional Features and Accessories
- Top oil dial type thermometer.
- Pressure vacuum gauge.
- Pressure relief device in tamperproof housing.
- Instrument accuracy potential transformers.
- Single ratio current transformers mounted over the low voltage bushings.
- Distribution lightning arresters mounted in high voltage compartment.
- Single conductor and three conductor potheads.
- Elastimold load break and non-load break bushing well inserts.
- Loop feed clamp type terminals.
- High voltage phase isolation to include between phases, dead front barrier or complete phase isolation.
- Radiator guards.
- Low voltage bus duct opening or flanged throat.

Features and Accessories



Rectangular Core and Coils

WSS Tap Changer
The Westinghouse externally operated WSS tap changer provides positive sequence line voltage changes under no-load conditions. An in-line assembly, the WSS features through-type stationary contact studs rigidly supported by a molded plastic channel. Moving contacts are spring loaded, silver plated copper which move along the stationary line by means of a rack and pinion.

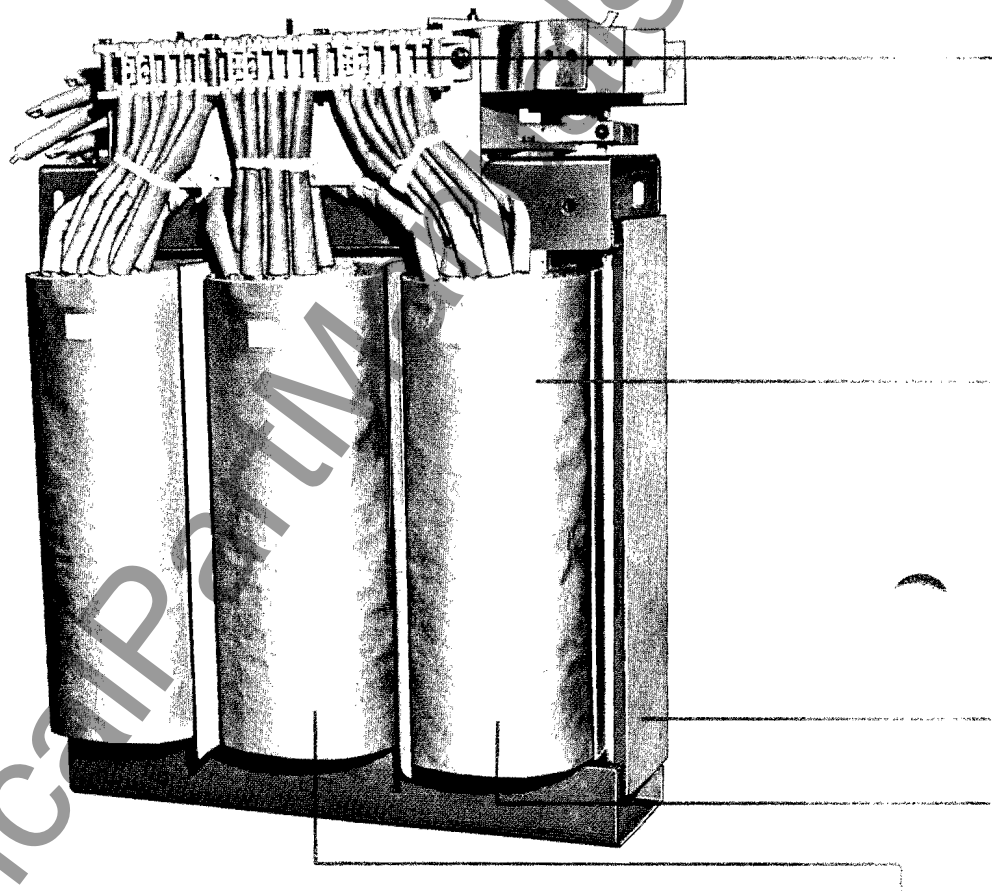
This design has no rivets, bolts or nuts, thus assures the proper contact of current carrying parts when taps are changed. With **no** reported outages, the WSS benefits the user through a reduction of repair or replacement costs by eliminating faulty tap changer operation, the cause of failure in 20% of all power transformers.

Rectangular Aluminum Wound Coils
The Westinghouse rectangular wound coil features aluminum conductor in both high and low voltage windings. The low voltage winding is accomplished on a constant tension machine and consists of full width sheet aluminum extending the full height of the coil. High voltage strap aluminum is wound directly over the low voltage winding on a constant tension traversing machine. Layer to layer and high to low insulation is diamond epoxy paper which when heat treated bonds the complete coil into a solid configuration.

The advantage of low voltage sheet aluminum is a continuous cross section of conductor that allows the electrical centers of high and low voltage windings to easily align themselves, virtually eliminating the vertical component of short circuit force.

The benefit is a coil so uniform and compact, the chance of windings overlapping during short circuit is minimized, reducing failure rate, repair and/or replacement cost.

Welded Frame
The Westinghouse exclusive welded frame provides a superior six piece supporting structure for the core and coils. End plates are thick steel slabs that are assembled in a mechanical and pressure jig around the core and coils, then welded to top and bottom plates to form a rigid structure that will not loosen during assembly, shipment, or in service. To determine the thickness of members used (even the thickness of welds), a short circuit calculation is made for each unit to determine the forces of short circuit.



The result is an assembly that restrains more effectively vertical and horizontal components of force, decreasing the probability of failure during severe short circuits.

This benefits the user by a reduction in repair or replacement costs and a reduction in downtime that means loss of service or lost production.

Step-Lap Core
The Westinghouse exclusive stacked core provides a superior flux path by utilizing the patented step-lap joining of core legs to top and bottom yokes. Hand stacked Hypersil steel punchings with interlocking laminations can be more uniformly and rigidly braced to prevent shifting during service.

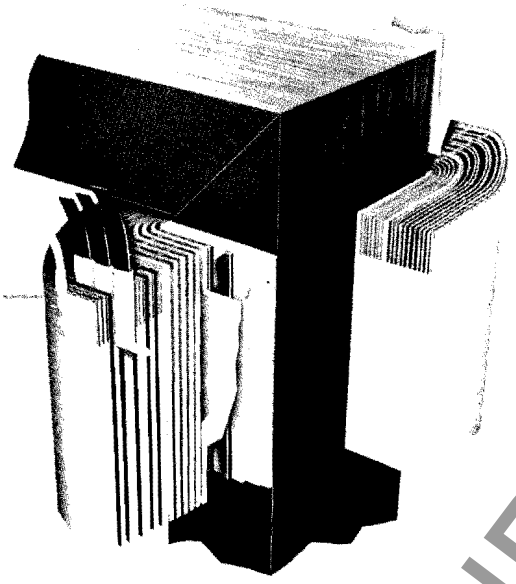
The user can benefit through reduced sound levels, lowered iron and total losses, and decreased exciting current to lower total operating cost.

On wye-wye units a fourth leg is added to provide a path for circulating third harmonic flux during unbalance condition.

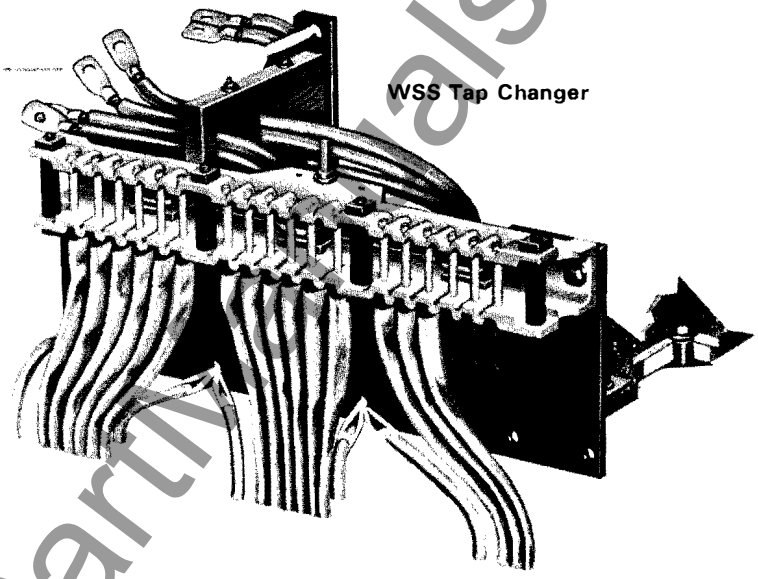
Super Insuldur Insulation
The Westinghouse Super Insuldur insulation effectively upgrades cellulose insulating materials thermally for increased load and overload capability. Retarding insulation breakdown under severe temperature conditions, the chemical stabilizers in the insuldur process minimize dimensional changes in the insulating materials insuring a tighter structure, contributing to greater strength and coil integrity througnout the life of the transformer.

The user benefit is a coil that better withstands short circuit and allows an operation at 10°C higher temperature on a 55°C rated unit with a 12% increase in KVA capacity.

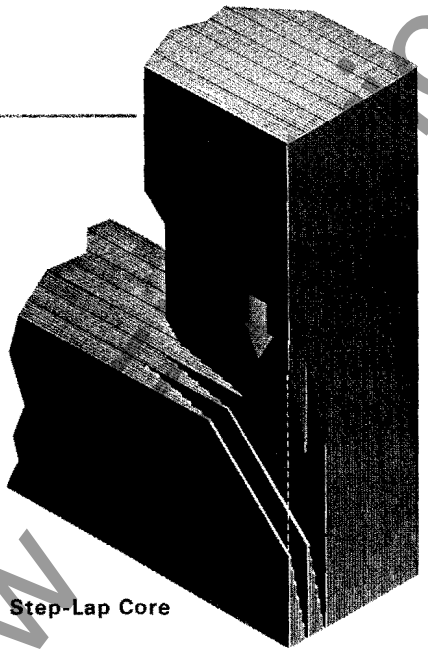
Rectangular Core and Coils



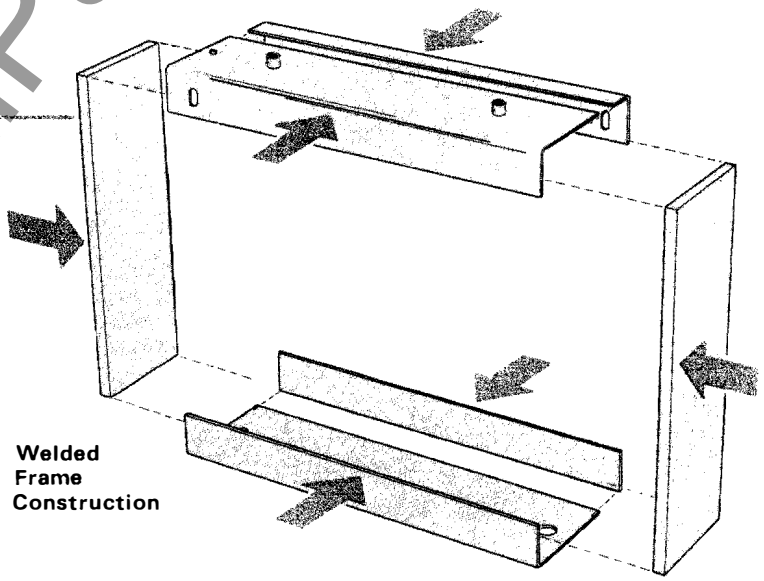
Rectangular Aluminum Wound Coils



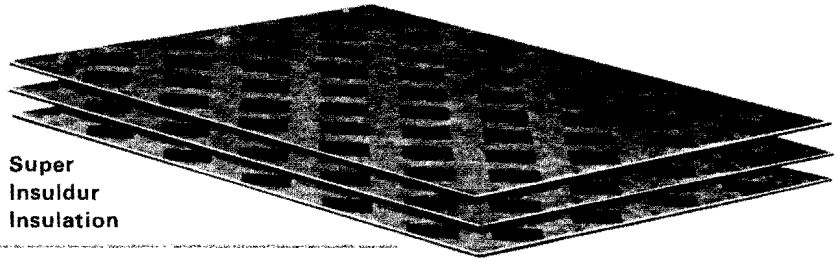
WSS Tap Changer



Step-Lap Core



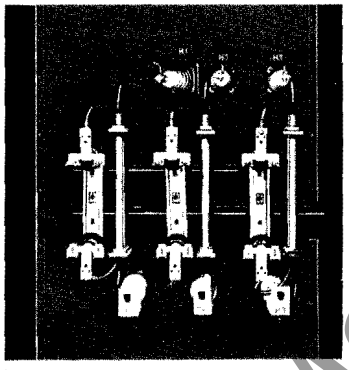
Welded Frame Construction



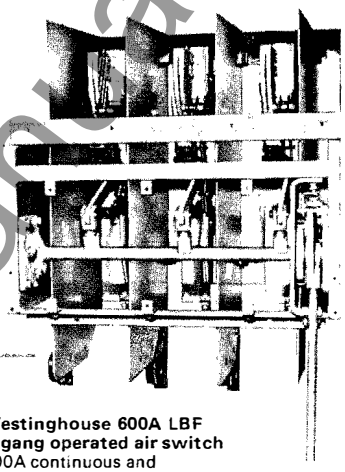
Super Insuldur Insulation

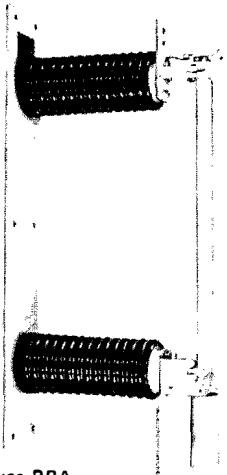
Switching and Fusing

Switching and Fusing
The Westinghouse Plazapad transformer is available with a wide selection of primary switching and fusing arrangements to meet every application.



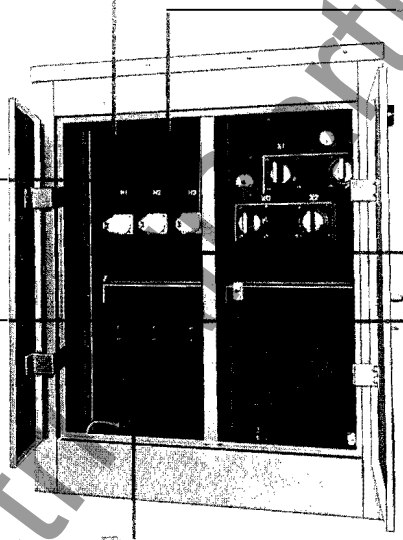
McGraw Edison Line Material disconnect switches
Arc Strangler disconnect
40A fused disconnect, NX fuses
80A fused disconnect, NX fuses

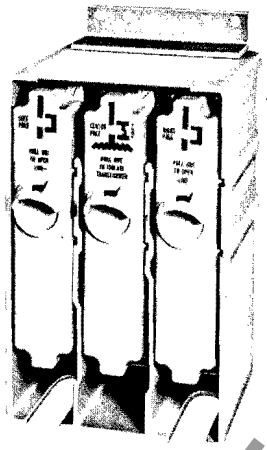


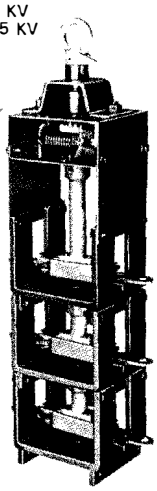


Westinghouse RBA disconnect or stationary fuse assembly

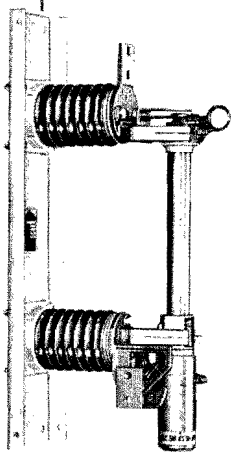
Westinghouse 600A LBF gang operated air switch
600A continuous and loadbreak
61,000A asymmetrical at 5 KV
40,000A asymmetrical at 15 KV
RBA fuses
CLE fuses



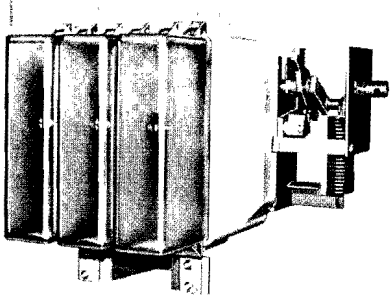




Westinghouse 300A LBOR gang operated liquid switch
300A continuous and loadbreak
10,000A symmetrical
16,000A asymmetrical
Internal fuse links
2 or 4 position



Westinghouse 200A EFD air switch, radial or loop feed
200A continuous and loadbreak
5000A symmetrical
10,000A asymmetrical
CLT fuses
RBA fuses

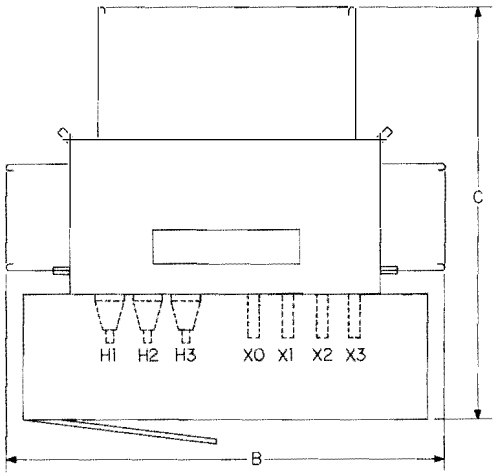


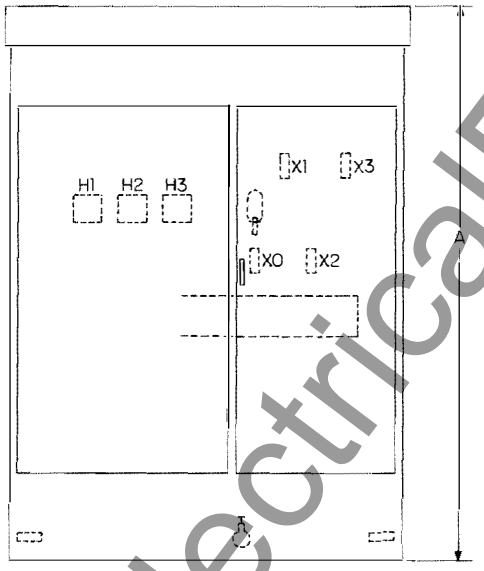
S&C hookstick operated disconnect switches
200A standard duty, unfused
600A heavy duty, unfused
50A fused disconnect, SM fuses
200A fused disconnect, SM fuses

Westinghouse 600A Molded Power Switch
600A continuous and loadbreak
40,000A symmetrical at 15 KV
RBA fuses
CLE fuses

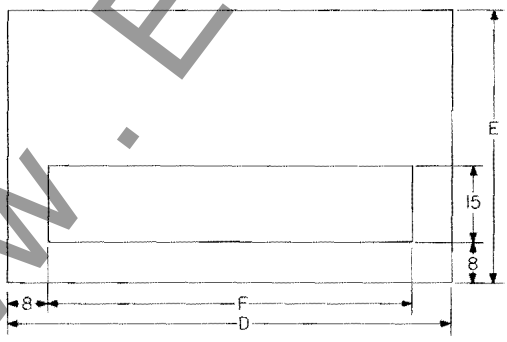
Also available (not pictured):
- 100A, 200A and 300A (5 KV only) oil fused cutouts
- 200A Trig-R-Lign liquid switch, fused or unfused, 2 or 4 position

Dimensions and Engineering Data





Recommended Pad Size



A Standard Unit is Self-Cooled, Oil-Immersed Rated 65°C Rise.

15 KV Class, Delta Connected HV-HV 95 KV BIL, LV 30 KV BIL①

Kva	Transformer			Pad			Total Weight	Gal. of Liquid
	A	B	C②	D	E③	F		
750	76	65	69	68	68	51	7250	320
1000	77	65	78	68	69	51	8150	330
1500	80	65	86	68	70	51	9700	370
2000	83	65	95	68	71	51	11600	420
2500	87	70	99	68	73	51	13375	470

15 KV Class, WYE Connected HV-HV 95 KV BIL, LV 30 KV BIL①

Kva	Transformer			Pad			Total Weight	Gal. of Liquid
	A	B	C②	D	E●	F		
750	77	65	69	68	68	51	7900	330
1000	80	65	76	68	69	51	9050	350
1500	83	68	84	68	69	51	10975	395
2000	87	73	88	74	71	57	13450	480
2500	90	77	95	76	74	59	15725	550

25 KV and 35 KV Class, WYE Connected HV-HV 125 BIL, LV 30 KV BIL①

Kva	Transformer			Pad			Total Weight	Gal. of Liquid
	A	B	C②	D	E③	F		
750	77	77	68	80	68	64	9100	410
1000	84	77	74	80	69	64	10300	450
1500	88	77	77	80	70	64	12400	485
2000	90	77	86	80	72	64	14400	535
2500	93	79	94	80	72	69	16425	570

①Standard low voltages are 208Y and 240Δ (through 1500 KVA only), 480Y and 480Δ.
②Standard compartment depth is 22 inches. Depth may be altered by the addition of switching and fusing.
③Extends under base of transformer only. Does not include rear coolers.

Insulation Levels

KV	Induced Test 120 Hertz	Applied Test 60 Hertz	BIL
1.2		10	30
2.5		15	45
5.0	Twice	19	60
8.6	Times	26	75
15.0	Normal	34	95
25.0①		40	125
35.0①		40	125

①Wye-Wye

Impedance: 5.75% subject to NEMA tolerance of plus or minus 7½%.

Cooling: Transformers may be cooled by WEMCO® "C" oil, or Inerteen.

Windings: Only two winding transformers without H.V. Delta-Wye board or series multiple in either winding.

Wye-Wye Connections: The H.V. and L.V. neutrals will be tied together internally by a removable link and brought out through a L.V. bushing and grounded to the tank wall.

NEMA Audible Sound Levels

Equivalent Two Winding KVA Self Cooled	Average Level in Decibels
700-1000	58 DB
1001-1500	60 DB
1501-2000	61 DB
2001-2500	62 DB

Temperature Guarantees

(Altitudes not to exceed 1000 meters or 3300 feet)

	Ambient ①	Rise ②	Hotspot Rise
Standard	30°C	65°C	80°C
Optional	30°C	55°C	65°C

●30°C average ambient temperature of cooling air not to exceed 40°C max. over any 24 hour period.
②Degree rise is the average winding temperature rise by resistance.

PLAZAPAD™
Tamperproof Transformers
For Underground Power Distribution

3 Phase, Liquid Immersed
750 Thru 2500 Kva

Further Information

Price List 48-131, Power Transformers, Tamperproof Design
Descriptive Bulletin 36-654, High Voltage Power Fuses, RBA
Descriptive Bulletin 46-256, Type LBOR Load Break Oil Switch
Descriptive Bulletin 46-356, Type EFD Switch
SA 10099, Rectangular Coil Core Form Transformers
SA 9025B, Westinghouse Insuldur
M 7205, Why Westinghouse Rectangular Coil Core Form Transformers Withstand Short Circuit

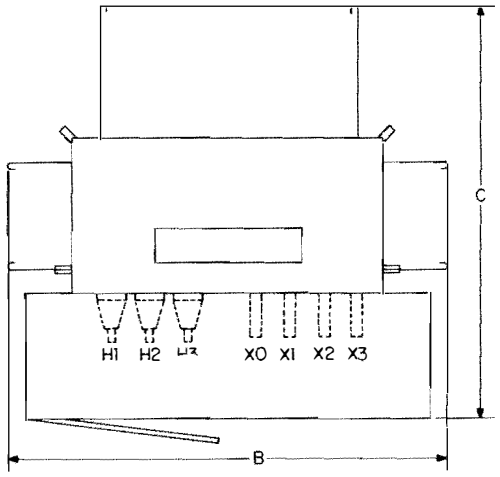
Or contact your nearest Westinghouse Sales Office.

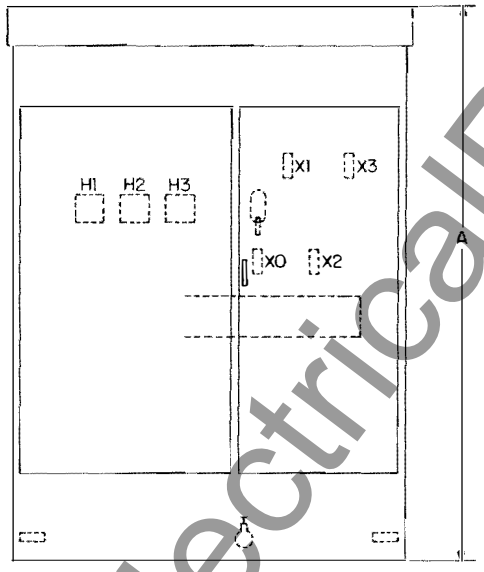
Westinghouse Electric Corporation
Distribution Transformer Division, South Boston, Va. 24592
Printed in USA

Westinghouse

Dimensions and Engineering Data

This page replaces page seven of DB 48-153 dated November, 1971.





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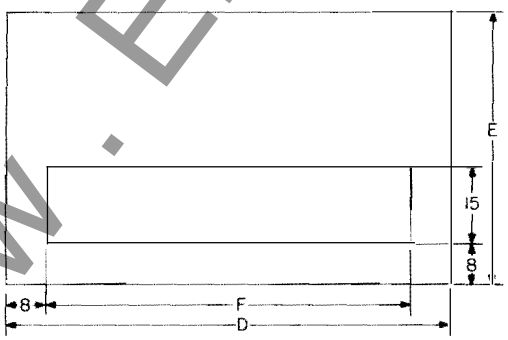

A Standard Unit is Self-Cooled, Oil-Immersed Rated 65°C Rise.

15 KV Class, Delta Connected HV-HV 95 KV BIL, LV 30 KV BIL①

Kva	Transformer A	B	C②	Pad D	E③	F	Total Weight	Gal. of Liquid
750	66	65	75	68	68	52	6600	260
1000	66	65	83	68	69	52	7500	280
1500	71	65	95	68	70	52	8950	310
2000	76	77	98	68	71	52	10600	335
2500	80	95	100	68	73	52	11250	380

15 KV Class, WYE Connected HV-HV 95 KV BIL, LV 30 KV BIL①

Kva	Transformer A	B	C②	Pad D	E③	F	Total Weight	Gal. of Liquid
750	72	65	75	68	68	51	7100	265
1000	72	65	83	68	69	51	8000	285
1500	76	65	92	68	69	51	9800	305
2000	80	71	96	70	71	57	11750	340
2500	84	81	99	74	74	59	14100	415

25 KV and 35 KV Class, WYE Connected HV-HV 125 BIL, LV 30 KV BIL①

Kva	Transformer A	B	C②	Pad ●	E③	F	Total Weight	Gal. of Liquid
750	72	77	75	80	68	64	9100	355
1000	72	77	83	80	69	64	10300	365
1500	79	77	92	80	70	64	12400	410
2000	81	77	96	80	72	64	14400	440
2500	85	80	99	80	74	69	16450	490

① Standard low voltages are 208Y and 240△ (through 1500 KVA only), 480Y and 480△.
② Standard compartment depth is 22 inches. Depth may be altered by the addition of switching and fusing.
③ Extends under base of transformer only. Does not include rear coolers.
Dimensions are approximate–not for construction

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KV	Induced Test 120 Hertz	Applied Test 60 Hertz	BIL
1.2		10	30
2.5		15	45
5.0	Twice	19	60
8.6	Times	26	75
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	Ambient ①	Rise ②	Hotspot Rise
Standard	30°C	65°C	80°C
Optional	30°C	55°C	65°C

●30°C average ambient temperature of cooling air not to exceed 40°C max. over any 24 hour period.
●Degree rise is the average winding temperature rise by resistance.

Westinghouse Electric Corporation
Distribution Transformer Division, South Boston, Va. 24592
Printed in USA

June, 1973
New Information
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