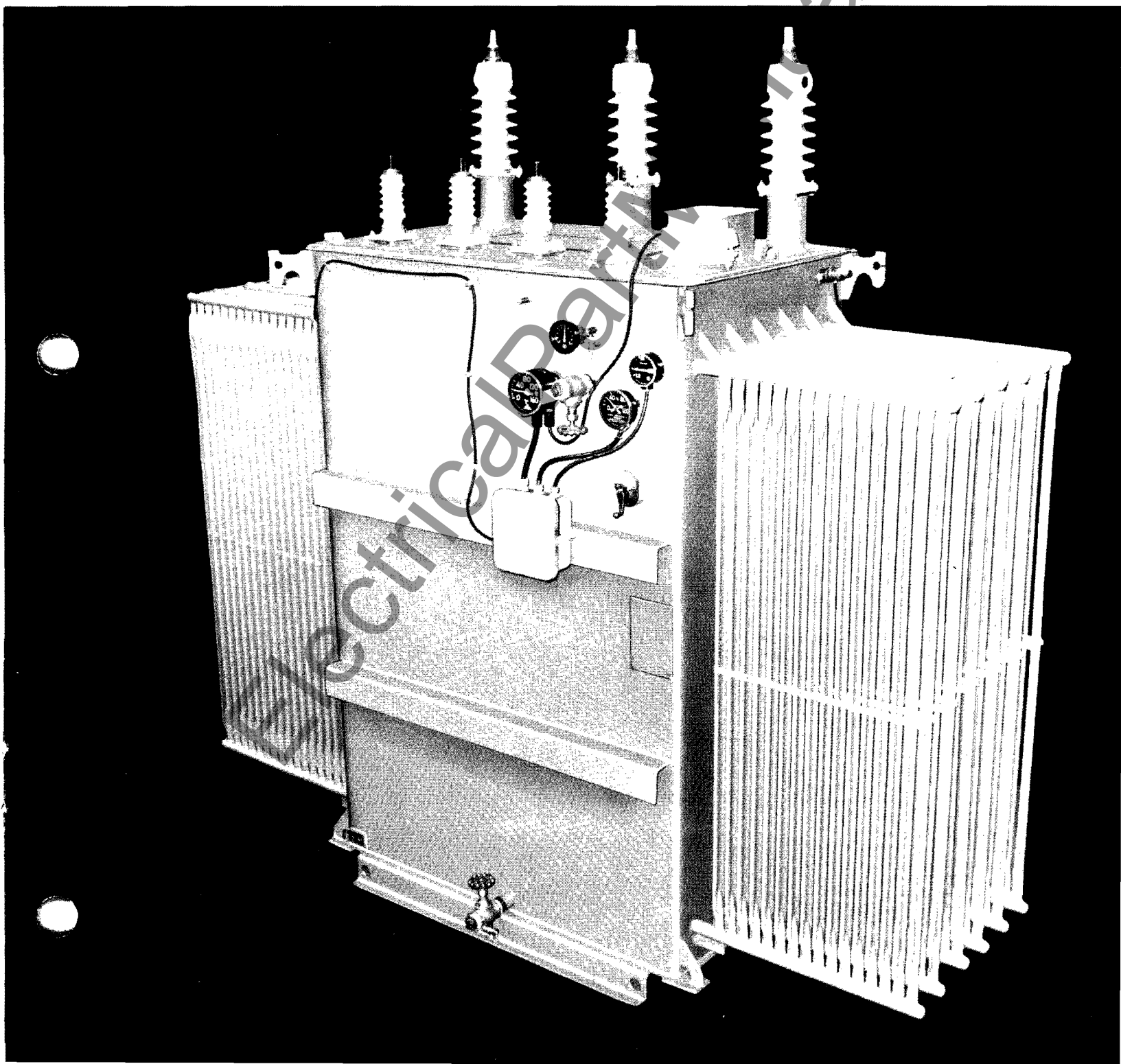
Westinghouse Electric Corporation
Small Power Transformer Division
South Boston, Virginia 24592

January, 1976
Supersedes DB 48-150, Pages 1-8
dated May, 1969
E, D, C/2099/DB

750-5000 KVA OA 3 Phase
833-3333 KVA OA 1 Phase
45-350 KV BIL
2.4-69 KV

Type RSL Liquid Immersed Substation Transformers



Application
South Boston type RSL rectangular core and coil construction transformers are the most reliable and relatively economical substation transformers available to serve the variety of power and lighting needs found in today's diversified utility, industrial and commercial markets. Not only are they designed to meet the latest applicable ANSI, NEMA and IEEE standards and test codes but their less than 1.0% field failure rate and their approximately 99% efficiency provide a standard for the industry. The design and construction of each unit undergo the rigors necessary to assure such continued performance.

Described herein are some of the standards and visible components incorporated into these Westinghouse substation transformers – each scientifically designed and tested and carefully constructed for each project order.

Type RSL transformers are designed in accordance with ANSI standard C57.12.10-1969 to meet the need for an economical and reliable line of quality substation transformers to serve diverse power loads.

Advantages

Specification
Adherence to ANSI standard guidelines results in proven designs with complete accessory equipment and necessary features. Specifications may thereby be more simple and concise while the net cost is reduced up to 40%.

Design and Construction
The use of advanced engineering techniques and optimized design computer programs result in more well proportioned and compact designs. A continuing plant modernization program applies the latest in automated equipment and modern manufacturing processes to assure peak performance plus uniform quality and highest reliability.

Short Circuit Strength
Core and coil designs have been thoroughly tested and developed through research using ANSI C57.12(10.1.1) and C57.12.90a criteria. The result is a family of designs capable of withstanding the 200,000-1,000,000 lb. short circuit forces thrust upon the transformer component in the modern power system.

Thermal Capacity
The improved Insuldur® and liquid insulation system is the result of an extensive program of research and development. This system allows the highly favored and widely specified Westinghouse 55°C/65°C capability to operate continuously at 100%/112%.

Handling and Maintenance
Compact designs reduce the cost of rigging and hauling and require smaller installation space. The clean design and simplified accessories reduce maintenance costs approximately 10% while liquid filled shipping reduces installation costs by hundreds of dollars.

Standard Characteristics Features and Tests

Standard features
1. **Tap changer** for de-energized operation with operating handle usually connected through side of tank. Height convenient to transformer design. Provision for padlocking.

2. **Magnetic liquid level gauge** (LLG) ①

3. **Dial type thermometer** (DTT) ①

4. Valve to serve as **drain valve, bottom filter press connection and liquid sampling valve.** ③

5. Valve for **top filter press connection.** ②

6. **Lifting hooks** on tank, lifting eyes on cover and provision for jacking.

7. **Base** of transformer has members forming a rectangle. Permits rolling in the direction of center lines of the ANSI segments. Points of support of members so located that the safe angle of tilt of base will be 15 degrees from the horizontal.
Arrangements for pulling the transformer parallel to centerlines of segments provided in base.

8. **Tank grounding provision** consists of two copperfaced steel pads, each 2 inches by 3½ inches, with two holes horizontally spaced on 1¾ inch centers and drilled and tapped for ½ inch, 13 NC thread. Minimum thickness of copper facing will be 0.015 inch. Minimum threaded depth of holes will be ½ inch.
Ground pads will be welded on tank wall near the base.
Purchaser to supply ground connectors.

9. **Sealedaire®** oil preservation is standard on all ratings.

10. **Pressure-vacuum gauge** (PVG) ②

11. **Main tank cover** will be welded on.

12. **Handhole** on cover.

13. Cover-mounted mechanical **pressure relief device** (PRD). ① ②

14. **Instruction nameplate.**

15. **Tank finish.**

A. Outdoor units. Standard tank finish is AN Standard sky grey No. 70. AN Standard dark grey No. 24 can be supplied without price addition but must be specified at time order is placed.

B. Indoor units. Standard tank finish for indoor units is AN Standard light grey No. 61 (Munsell 8.3G6.10/0.54).

16. **Radiator valves** when detachable radiators supplied.

17. When auxiliary cooling equipment is furnished with transformer, auxiliary wiring is terminated at **terminal board** in control cabinet with drill plate provided for conduit entrance.

18. **Automatic control for auxiliary cooling** equipment from contacts on the liquid temperature indicator (DTT).

19. **Cover-mounted bushings** including neutral bushing for three-phase transformers standard for both high-voltage and low-voltage winding. Sidewall bushings supplied where possible, necessary, or specified.

① Alarm contacts will be furnished without charge, when specified with the order.
② Standard only above 2499 KVA and/or above 200 Kv BIL.
③ Drain and sampling fittings for Inerteen filled units are separate.

Standard Tests
The following tests will be made on all transformers except as specifically stated below. The numbers shown do not necessarily indicate the sequence in which the tests will be made. All tests will be made in accordance with the latest revision of ANSI Standard Test Code C57.12.90.

1. **Resistance measurements** of all windings on the rated voltage connection of each unit and at the tap extremes of one unit only of a given rating on an order.

2. **Ratio tests** on the rated voltage connection and on all tap connections.

3. **Polarity and phase-relation tests** on the rated voltage connection.

4. **No-load loss** at rated voltage on the rated voltage connection.

5. **Exciting current** at rated voltage on the rated voltage connection.

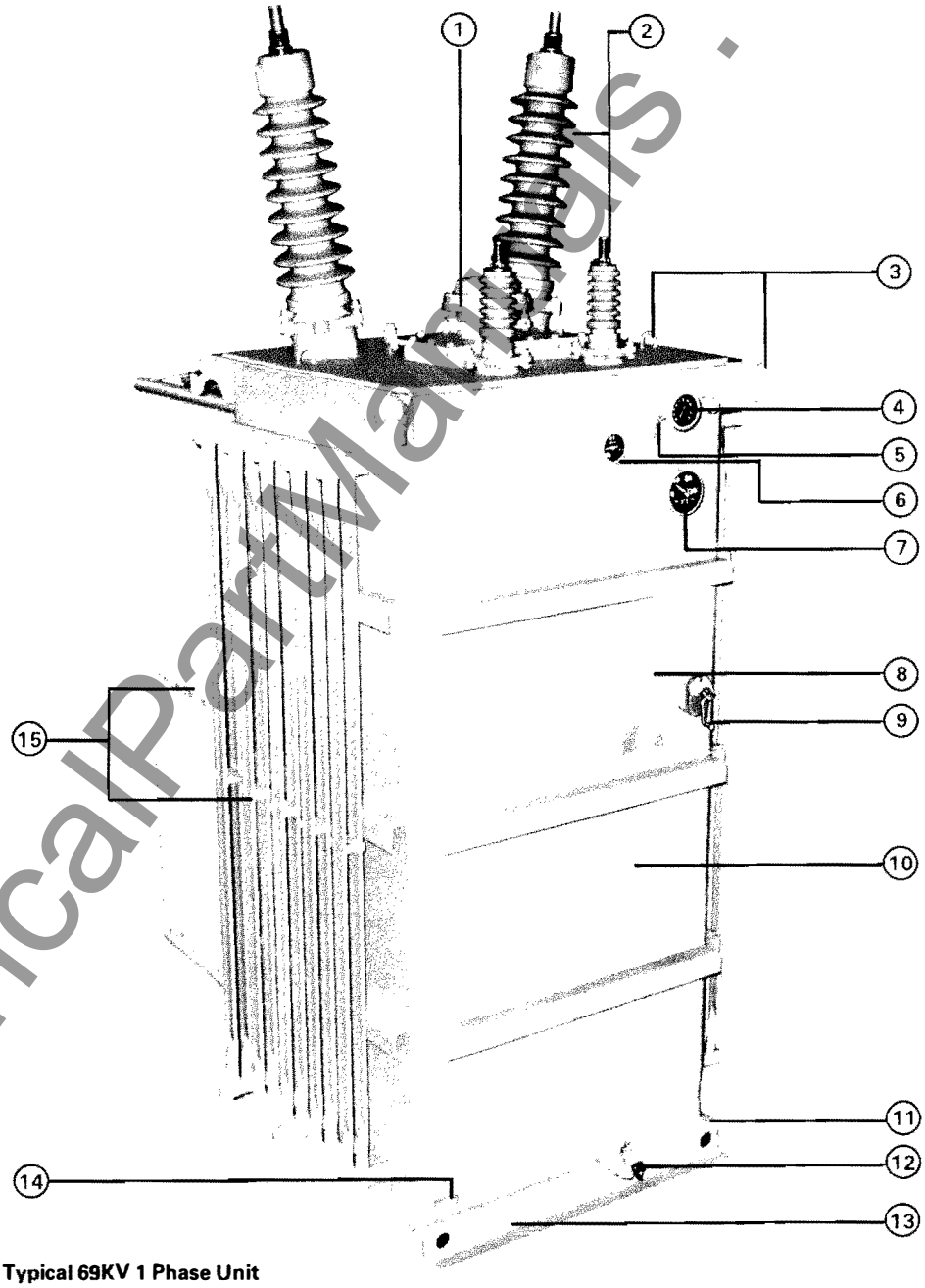
6. **Impedance and load loss** at rated current on the rated voltage connection of each unit and on the tap extremes of one unit only of a given rating on an order.

7. **Temperature test:**
a. 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 no available record of a temperature test on a duplicate or essentially duplicate unit.

b. Subject to the limitations of the preceding paragraph (a), when a transformer is supplied with auxiliary cooling equipment to provide more than one kva rating, temperature tests will be made only on the following:
55°C OA rating
65°C FA rating

8. **Applied potential tests.**

9. **Induced potential tests.**



Typical 69KV 1 Phase Unit

① **Pressure Relief Device**

② **Bushings**

③ **Cover Lifting Eye and Tank Lifting Lugs**

④ **Pressure Vacuum Gage**

⑤ **Sealedaire**

⑥ **Liquid Level Gage**

⑦ **Dial Type Thermometer**

⑧ **Nameplate**

⑨ **De-energized Tap Changer Handle**

⑩ **Tank**

⑪ **Jack Pad**

⑫ **Drain Valve**

⑬ **Base**

⑭ **Grounding Pad**

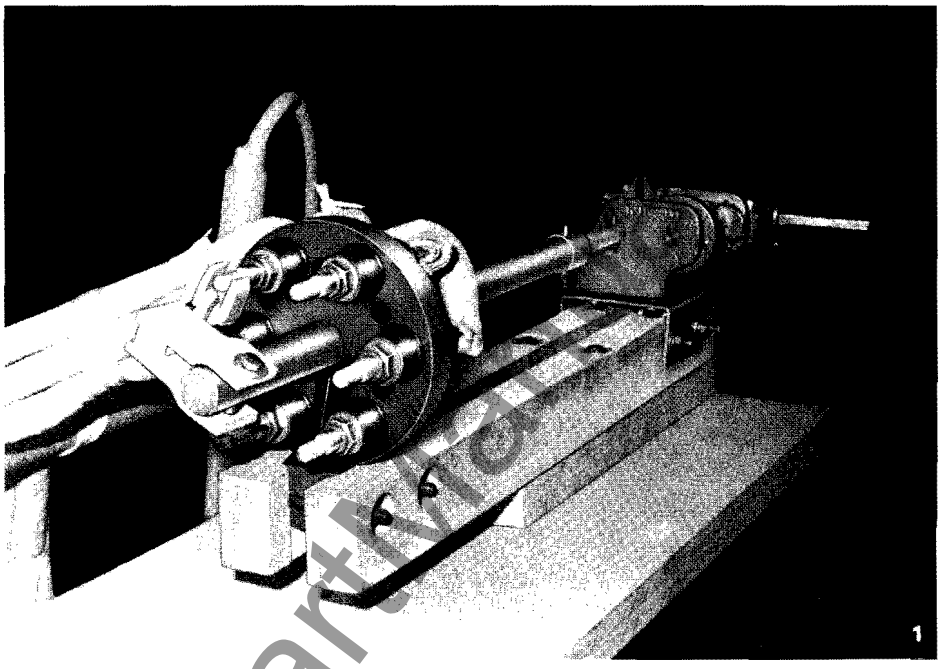
⑮ **Coolers**

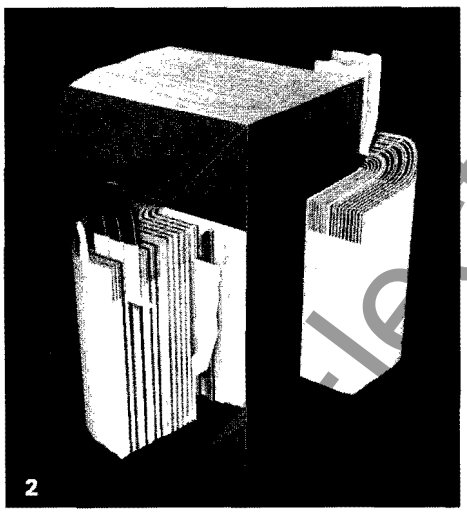
De-energized Tap Changers
Both types available incorporate a molded design that eliminates bolts, rivets and possible misalignment of the stationary contacts.

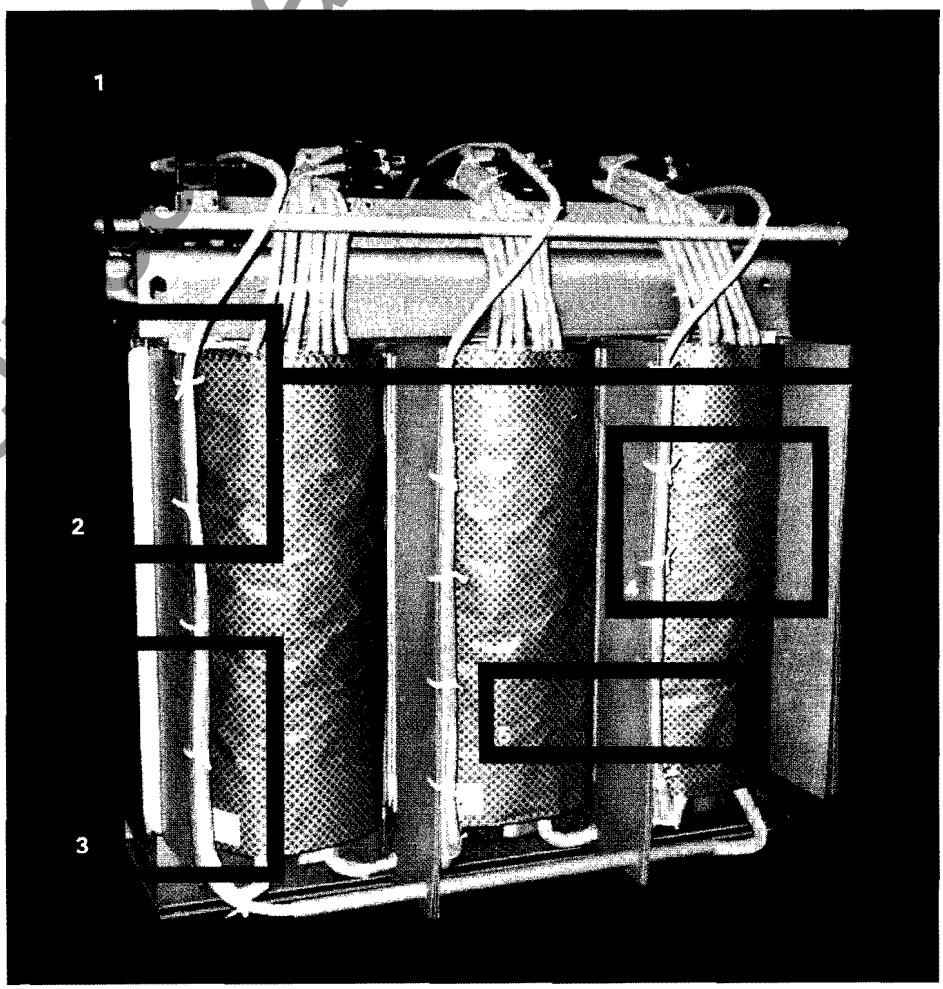
Type WSB
The type WSB tap changer is used for voltages over 34.5 KV, currents over 250 amperes, or for special tap arrangements. Self-cleaning moving contacts are wiped on each tap changer operation. Two parallel moving contacts assure firm positive pressure through the use of mechanical and magnetic forces. The result is positive, trouble free operation which eliminates approximately 20% of costly transformer downtime reportedly due to tap changer failures.

The mechanism employs a Geneva gear-cam assembly which controls the movement of the tap changer and assures positive positioning at the finish of each complete revolution. A padlocking provision is furnished on each handle assembly to allow for increased system safety and reliability. Tap changer positions are clearly marked to complement the positive positioning mechanism. Uncertainty is eliminated for the authorized operator.

Type WSS
This excellent unit is also utilized in substation transformers for standard tap arrangements in applications up to 34.5 KV and 150 amperes. See DB 47-156 for further details.

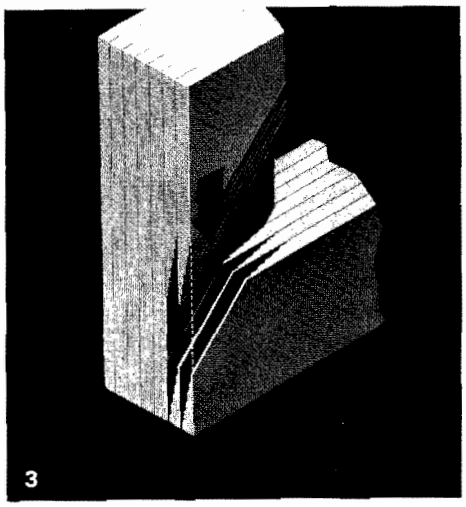






Rectangular Wound Aluminum Coils
The Westinghouse rectangular wound coil features aluminum conductor in both high and low voltage windings. These windings are produced with the control of constant tension machines. Where feasible, the low voltage conductor is a full height sheet assembly providing a 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 high voltage aluminum strap is wound directly over the low voltage winding. Layer and high-low insulation is diamond epoxy insuldur paper which helps bond the complete coil into a solid configuration when thermo set. The results of the winding procedures are compact and uniform coils which are tightly compressed and bonded. Therefore, the chance of winding shifts under short circuit are further lessened. Failure rate and repair and/or replacement costs are all minimized.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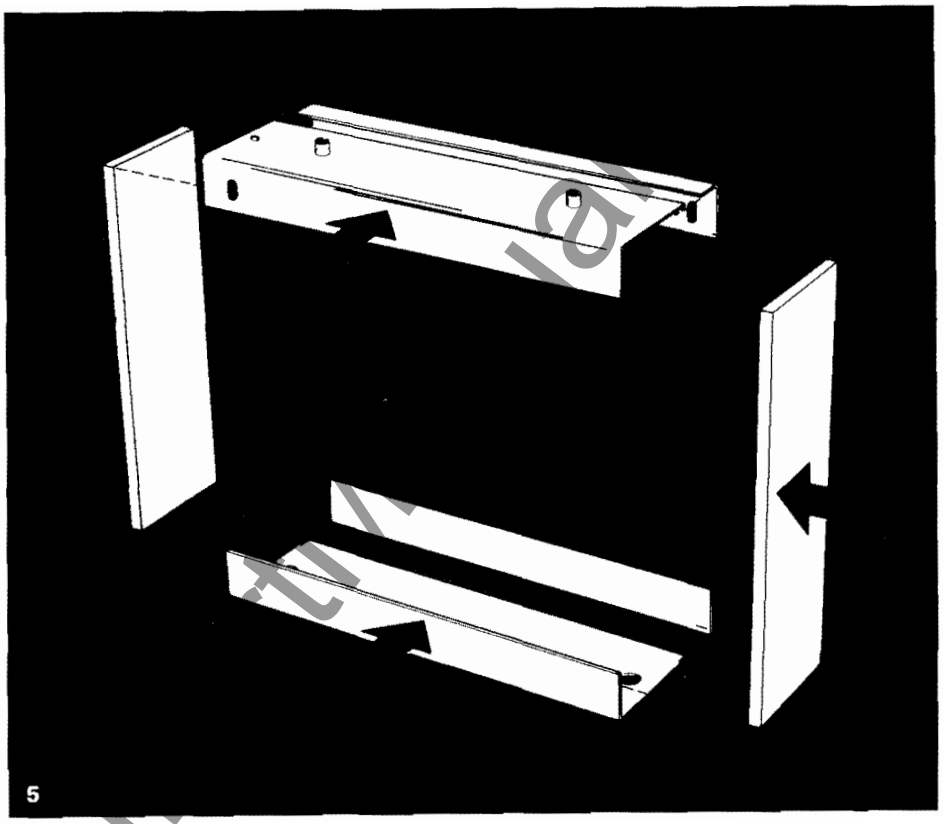
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Step-Lap Core
The Westinghouse exclusive stacked core provides a superior flux path by utilizing the patented step-lap joining of core legs to top and bottom yokes. Hand stacked Hypersil steel punchings with interlocking laminations can be more uniformly and rigidly braced to prevent shifting during service.

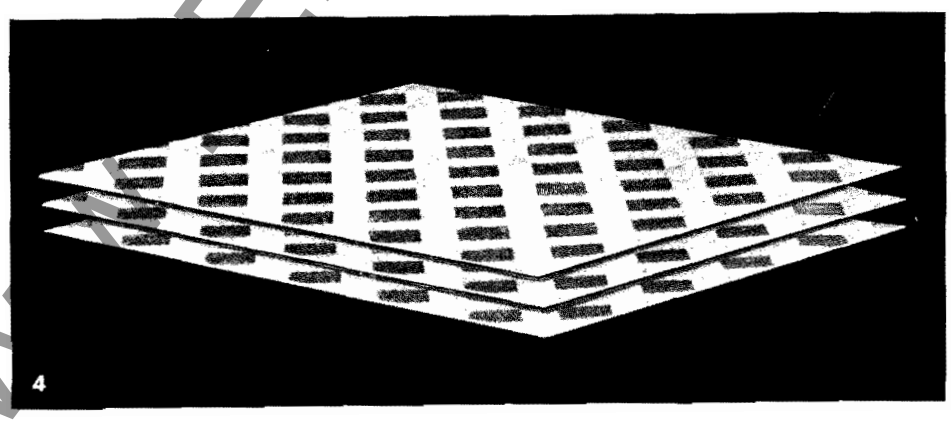
The effective core support method and the efficient step-lap joint have resulted in decreases in exciting current up to 40%, reductions in sound levels up to 3 db and reductions in iron loss up to 10%. Operating costs have been reduced by hundreds of dollars.

Super Insuldur® Insulation
The Westinghouse Super Insuldur insulation effectively upgrades cellulose insulating materials thermally for increased load and overload capability. The result is a coil that better withstands short circuits and allows a 55°C rated unit to operate continuously at 112% capacity without exceeding 65°C.

The chemical stablizers in the Insuldur process retard insulation breakdown under severe temperature conditions and minimize dimensional changes in the insulating materials. This insures a tighter structure and contributes to greater coil strength and integrity throughout the life of the transformer.

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 assembled around the core and coils, in a mechanical pressure fixture and welded to top and bottom plates to form a rigid structure. To determine the members used and the weld design, a computer design calculation is made for each unit including the forces of short circuit and the proper end plate modulus.

This assembly more effectively restrains the vertical and horizontal components of force thereby decreasing the probability of failure during severe short circuits. The customer realizes savings that sometimes amount to thousands of dollars due to a reduction in repair, replacement and downtime costs.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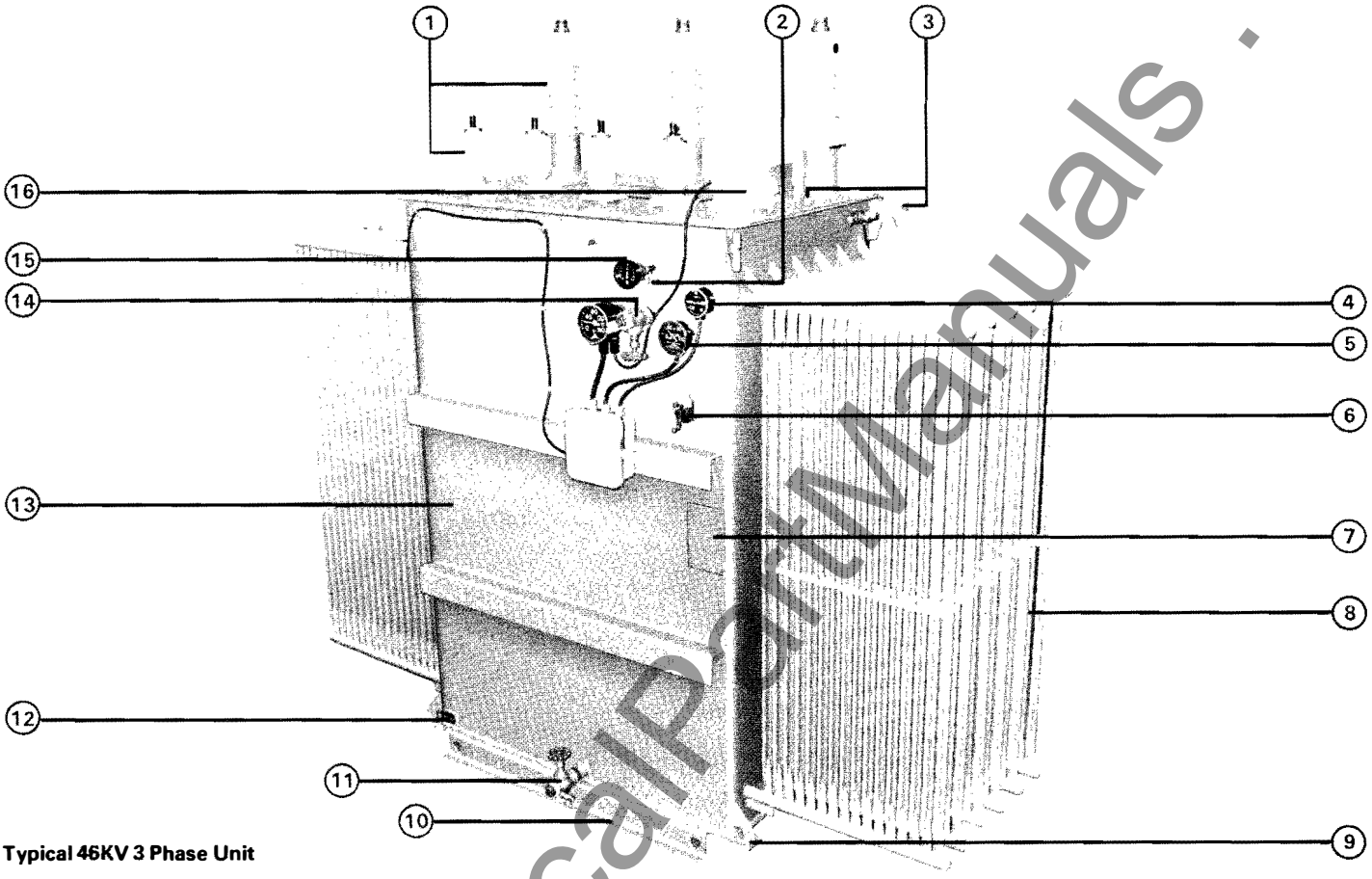


Typical 46KV 3 Phase Unit

① **Bushings** Standard: cover mounted, ANSI 70 Grey, type RJ solid up to 23 KV, type OS condenser 23 KV-46 KV, type O condenser 69 KV. Optional: Sidewall mounted (unit substation) cast resin type CR standard.

② **Sealedaire Oil Preservation System** Westinghouse Sealedaire system of oil preservation excludes oxygen and moisture, preventing deterioration of liquid and insulation. The transformer tank is filled with oil in a vacuum chamber. A relief valve assembly keeps the transformer sealed throughout an oil temperature range of 100°C. Pressure and vacuum-limiting valves are set to open at plus or minus 6.5 pounds per square inch. Gas samples for purging or for analysis may be taken. Not used for Inerteen filled units.

③ **Lifting Lugs and Eyes** Total of four lifting lugs on corners of tank for lifting entire unit. Lifting eyes on tank cover for ease of handling.

④ **Liquid Level Gauge** Float position transmitted magnetically through tank wall to gauge pointer. This preserves tank seal. ②

⑤ **Dial Type Thermometer** Mounted in well on tank wall. Indicates temperature of top liquid. Has magnetically resettable red peak temperature pointer. Provides fan control unless otherwise specified. ②

⑥ **De-Energized Tap Changer Control Handle** Operating handle usually installed through tank wall at a height convenient to the transformer design. Includes provision for padlocking.

⑦ **Instruction Nameplate** Stainless steel nameplate mounted on front tank wall (ANSI, Seg #1) at convenient height.

⑧ **Cooling System** Designed to fit individual requirements. Self-cooled (OA) consists of flattened external tubes welded into headers in turn welded into tank wall.

Optional forced air (FA) cooling employs fans to circulate masses of air. Purchaser supplies 208-240 volt single phase supply.

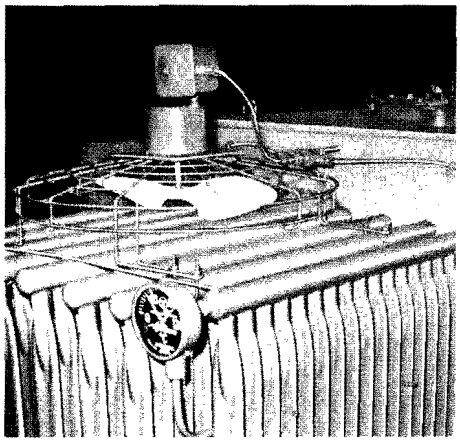
⑨ **Jack Pads** Bearing surfaces for jacks are provided at bottom corners.

⑩ **Base** Designed for ease in skidding or rolling. Holes provided for pulling and for ventilation to eliminate condensation.

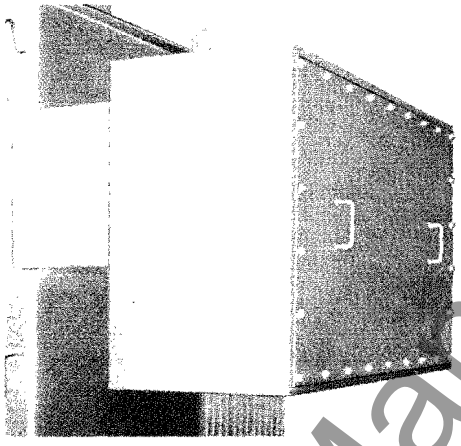
⑪ **Lower Drain Valve, Filter Press Connection and Sampling Valve** Assures complete liquid drainage from tank. Oil sampler at bottom. (If Inerteen®, sampler at top.)

⑫ **Tank Grounding Provision** Two copper faced steel pads with standard tapped holes located on front and rear tank walls near base.

⑬ **Tank** All tanks made of high-quality sheet steel with minimum number of seams. Seams and joints electrically welded. Tanks rectangular with rounded corners. Steel reinforcing members welded to outside walls add strength to withstand test and operating pressures. Bracing protects tank against distortion during shipment or installation. Tank walls flanged outward at top to form platform for welded cover plate. Handhole provided in cover for internal inspection and maintenance.

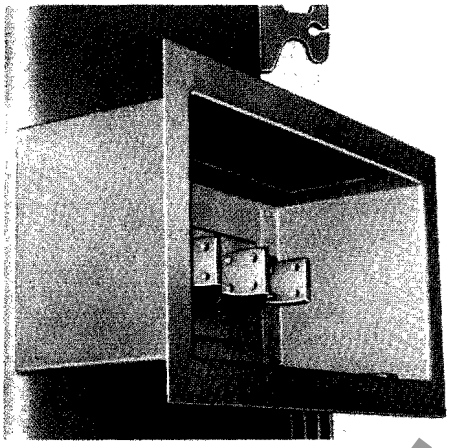


Standard Fan

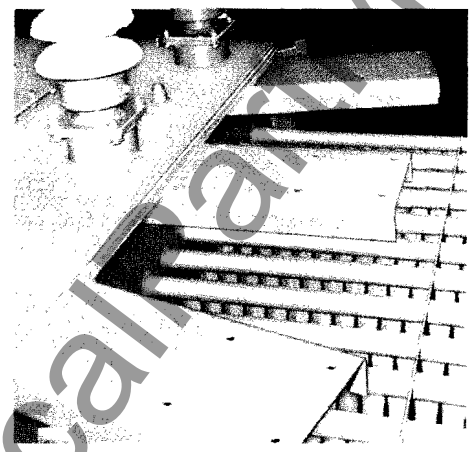


Throat Mounted Air Terminal Chamber

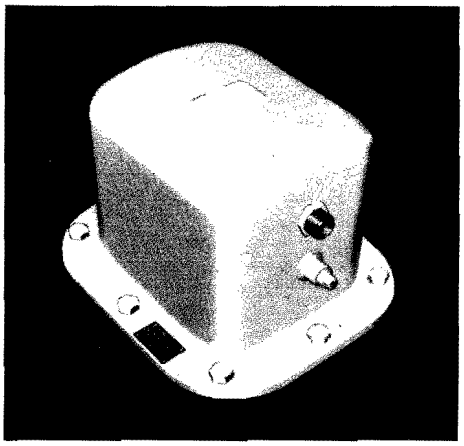
Primary Power Switch



NEMA Standard Bus Duct Throat



Lightning Arrester Mounting Brackets



Sudden Pressure Relay

Standard only above 2499 KVA and/or above 200 Kv.

⑭ **Upper Valve for Filter Press Connection**

⑮ **Pressure-Vacuum Gauge** Indicates pressure status inside tank gas space.

⑯ **Pressure Relief Device** Relieves abnormally high internal pressure. Factory calibrated to operate at 10 psi. Easily visible operation indicator. After operation, positively reseals and continues to give protection against the elements.② Yellow operation indication semaphore available.

① All fittings located on transformer front. ANSI Segment #1.
② Supplied with 1-NO, 1-NC alarm contact when specified.

Standard Finish
The Westinghouse standard finish is a three-coat system applied as follows:

A. All surfaces are shot blasted or pickled to a semi-white metal to form a completely clean surface.

B. A caustic wash and phosphatized coating to inhibit corrosion and furnish a base for high mechanical strength of paint bonding.

C. An epoxy-melamine primer coat containing zinc chromate cured in oven at 150°C.

D. A Westinghouse top coat, composed of an alkyd-melamine enamel paint system containing special pigments selected to give long outdoor service in varying climatic exposures and maintain attractive appearance, is applied and given a baked finish at 150°C.

E. An air-dry version of Item D. is applied to touch up units prior to shipment.

Standard outdoor tank finish is ANSI No. 70 (Munsell No. 5.0B67.0/0.4). ANSI No. 24 (Munsell No. 10B2.40/1.18) can be supplied but must be specified at the time order is placed. Other colors or other paints compatible with the paint wash flo-coat machinery may be available through special determination and negotiation.

Wemco "C" Oil
Wemco "C" insulating oil is a refined mineral oil obtained from the fractional distillation of crude petroleum. It contains no moisture, inorganic acid, alkali, free sulfur, asphalt, tar, vegetable, or animal oils. It is used as an insulating and heat transfer medium and is intended principally for use in tanks of oil insulated circuit breakers, switches and transformers.

Inerteen ®
Inerteen is an ASKAREL especially prepared by Monsanto Company to rigid Westinghouse specifications. Inerteen contains a hydrogen chloride scavenging agent specified by Westinghouse for maximum transformer life. Inerteen is non-corrosive and possesses the high dielectric strength required for an insulating and heat transfer liquid. Where specified it is used for indoor or outdoor designs up through 34.5 Kv Class. For simple field conversion either way between WEMCO "C" Oil and Inerteen refer to Westinghouse.

Standard Inerteen pour point is approximately −19°F; special −39°F.

Forced-Air Cooling
These substation transformers are supplied as standard with provision for future fan cooling. Provision consists of designing the transformer current carrying parts including internal parts for the greater capacity and having space available to receive the required external equipment. When fans are added in the future, an output increase of 15-percent is available on units up to 2499 kva and a 25-percent increase on units 2500 kva and above. The fans are normally located on the top of the tubular coolers for maximum efficiency. Research has shown that the air moving over the hottest part of the coolers provides greater cooling efficiency. This location reduces accidental damage, blows cleaner air, and reduces maintenance by locating the fans above accumulation of leaves and snow. Automatic control is normally actuated from a top-liquid temperature thermometer. The power supply by others should be based on 360 V.A. per fan and 208-240 V 1 phase only.

Lightning Arresters
Maximum surge protection is provided by installation of lightning arresters mounted directly on transformer tank brackets.

Westinghouse intermediate or station type arresters may be specified and furnished with the transformer or the transformer furnished with arrester brackets only for mounting customers' arresters. Arresters ship separately boxed (detailed).

Throat Connections
Bushing groups may be enclosed in a flanged throat (ANSI Standard C57.12.10 par. 10.2.4).

Terminal Chambers
Cable entrance compartments are available for primary and/or secondary terminations on units requiring up to 150 KV BIL. Cable entry/exit can be specified either top or bottom. Air insulated chambers are usually used for 15 KV and below services – oil filled terminal chambers for all voltages above 15 KV.

Further Information:
IB 45-063-99 Inerteen-54201CM
IB 45-063-100 Wemco "C" Oil
47-156 D WE A Power Centers
47-220 P WE A
47-229 F WE A, Dimensions
Reprint 200 Fault Protection and Indication
MA 375 Value Story
M-7205 Short Circuit Withstand
SA 9025 B Insuldur
SA 10099 Rectangular Coil Core Form Transformers
Askarel Guide – Bulletin IC/FF-38R

Westinghouse Electric Corporation
Small Power Transformer Division
South Boston, Virginia 24592

Sudden Pressure Relay
Protection against damage due to internal faults can be provided by a sudden pressure relay. This device operates on rate of pressure change; that is, the higher the rate of rise, the faster it operates. It will not operate on pressure changes due to changes in transformer temperature or loading, but it will protect against small arcs which would not cause a relief device to operate. On major troubles causing high rate of rise, it will operate within a half-cycle on a 60-cycle circuit.

Dial Hot Spot
Dial hot spot winding temperature equipment including a current transformer may be specified. Energy from a current transformer added to the temperature of the top oil in the tank operates a bimetallic element to indicate the simulated hot spot temperature of one phase of the transformer winding. A pointer on the large weatherproof indicator dial gives visual indication. Switches are provided to actuate cooling equipment and to control alarm circuits from a junction box.

Standard Ratings
All 55°C units have a supplementary Insuldur® rating of 112% with 65°C rise and 80°C hotspot rise as follows:

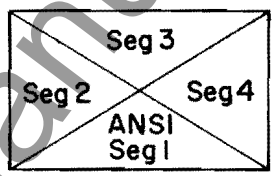
55°C OA Rating	65°C OA Rating	55°C FA Rating	65°C FA Rating
Single Phase Kva Ratings			
833	933	958	1073
1250	1400	1437	1610
1667	1867	1917	2147
2500	2800	3125	3500
3333	3733	4167	4666
Three Phase Kva Ratings			
750	840	862	966
1000	1120	1150	1288
1500	1680	1725	1932
2000	2240	2300	2576
2500	2800	3125	3500
3750	4200	4687	5250
5000	5600	6250	7000

Cable Terminals
Although not normally included, one clamp type terminal per phase can be furnished when specified at the time of order entry. Special terminals require specific negotiation due to their effect on the price and shipment of the transformer.

Current Transformers
Multi-ratio current transformers are applied for general application involving protective relays and indicating instruments. CT's can be included in the power transformer case on the bushing flange, or provision can be made for future installation by the user. Tap ratios, current ratings and accuracy are according to ANSI standards.

Transformer Description – ANSI Segments
Below is a facsimile of the ANSI drawing which serves as a guide in specifying transformers. Use of the ANSI segments more clearly and accurately locates components on the transformer quadrants. The segment applies to the sidewall as well as the cover portion shown. Segment #1 is the "front" by definition.

Transformer Plan View



"Front"
N.P., Fittings etc.

NEMA Audible Sound Levels

Equivalent Two Winding KVA Self Cooled (OA)	Average Level in Decibels
501-700	57 DB
701-1000	58 DB
1001-1500	60 DB
1501-2000	61 DB
2001-2500	62 DB
2501-3000	63 DB
3001-4000	64 DB
4001-5000	65 DB
Max. With Fans	67 DB

Temperature Guarantees
(Altitude not to exceed 1000 meters or 3300 feet)

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

① 30°C average ambient temperature of cooling air not to exceed 40°C max. over any 24 hour period.
② Degree rise is the average winding temperature rise by resistance.

Special Applications
Certain applications such as pulse loading, special duty cycles, seismic criteria and captive motor loadings require special design considerations. These differ from the general duty transformers as defined by industry standards which fill the majority of customer needs. Specific guidelines for special applications have been established. Refer all such special cases to Westinghouse.

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Westinghouse Electric Corporation
Small Power Transformer Division
South Boston, VA 24592

August, 1975
Supersedes DS 48-175, pages 1-2
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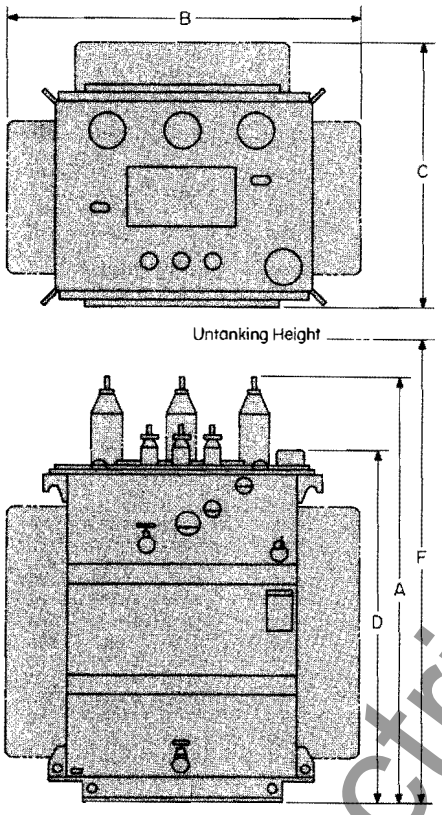
E, D/2091/DB

Three Phase Substations
750-5000 Kva
67 Kv and Below

Substation Transformers

Dimensions and Weights



These dimensions are for standard ratings as defined by standard electrical, mechanical, tests, etc. in Price List 47-220, dated September, 1975.

Further Information
Price List 47-220
Descriptive Bulletin 47-226

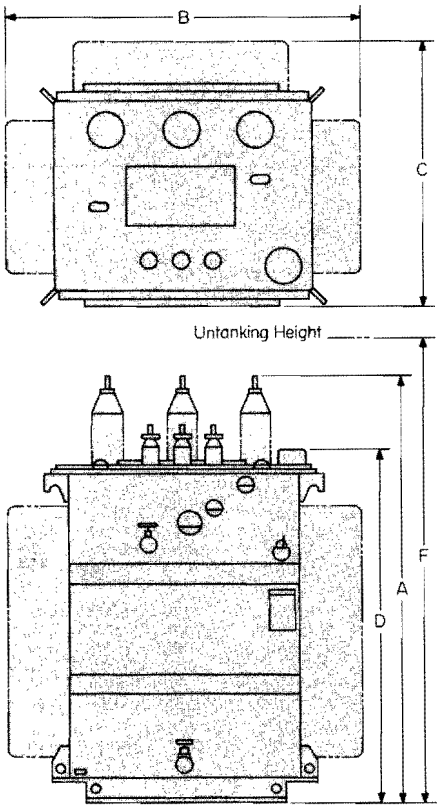
Three Phase 60 Hertz, Oil, 55°C, OA/Future FA

High Voltage Rating	Low Voltage Rating	Kva Rating	Dimensions in Inches					Weights in Pounds				Oil Volume
			A①	B	C	D	F	Core and Coils	Tank and Fittings	Oil	Total	Gallons
2400	480	750	91	58	61	72	131	2655	1465	2080	6200	277
4160	480Y/277	1000	92	58	74	73	133	3157	1853	2190	7200	291
4800	480Y/277	1500	93	70	82	76	139	4579	2461	2560	9600	341
6900	480	750	90	59	64	71	129	2708	1522	21 0	6400	289
7200	480Y/277	1000	93	59	72	74	135	3267	1763	2270	7300	302
		1500	94	73	82	76	139	4388	2482	2530	9400	337
		2000	98	95	85	80	146	5664	3006	3130	11800	417
		2500	99	110	85	83	152	6728	3392	3380	13500	450
6900	2400	1000	81	59	72	68	124	3465	1605	2130	7200	284
	2400Y											
7200	2520	1500	84	67	86	71	129	4598	1982	2720	9300	362
	4160Y	2000	87	86	86	74	135	5413	2537	3050	11000	406
	4360Y	2500	90	105	87	77	141	6296	2914	3390	12600	451
		3750	111	131	90	95	175	10680	3810	4910	19400	654
12000												
12470	480Y/277	750	90	59	62	71	129	2912	1478	2310	6700	307
13200		1000	91	59	72	75	137	3370	2000	2430	7800	323
13800		1500	92	71	83	76	139	4610	2510	2580	9700	344
		2000	93	95	84	79	144	5418	2972	2910	11300	388
		2500	94	107	87	79	146	6871	3369	3360	13600	447
12000	2400	1000	81	59	71	68	124	3365	1615	2120	7100	282
12470	2400Y											
13200	2520	1500	85	68	84	72	131	4434	2096	2470	9000	329
13800	4160Y	2000	86	94	86	73	133	5397	2403	2900	10700	386
	4360Y											
		2500	90	109	86	77	141	6352	2968	3080	12400	410
		3750	110	120	90	95	173	11180	3830	4890	19900	652
		5000	112	151	92	96	175	11581	4799	5120	21500	682
	2400											
22900	2400Y	1000	92	60	70	75	137	3415	1995	2490	7900	331
	2520	1500	98	65	84	81	148	4541	2459	2900	9900	386
	4360Y	2000	104	75	85	87	160	5761	2879	3360	12000	447
		2500	106	105	85	89	163	6440	3260	3600	13300	479
		3750	116	131	89	99	183	10109	4051	5040	19200	672
		5000	122	150	93	105	194	12577	4993	5730	23300	763
	4800	1000	92	60	71	75	13	3477	1993	2530	8000	337
22900	5040	1500	97	61	85	80	146	4486	2444	2970	9900	395
		2500	102	107	86	85	156	6232	3188	3480	12900	463
		3750	110	137	89	93	171	8562	3848	4390	16800	585
		5000	116	149	93	99	182	10595	4785	5020	20400	669
	6900	1000	92	60	71	75	137	3458	2052	2590	8100	345
	7200											
22900	7560	1500	97	61	84	80	146	4483	2407	2910	9800	388
	8320Y	2500	102	107	86	85	156	6232	3188	3480	12900	463
	8720Y	3750	110	137	89	93	171	8569	3801	4430	16800	590
		5000	116	150	94	99	182	10497	4803	5100	20400	679
	12000	1000	92	60	73	75	137	3481	2069	2550	8100	339
22900	12470Y											
	12600	1500	97	65	85	80	146	4649	2481	2970	10100	396
	13090Y	2500	103	95	87	86	158	6552	3208	3740	13500	498
	13200											
	13200Y	3750	112	137	90	95	175	9013	3917	4770	17700	635
	13800Y	5000	116	150	94	99	183	11237	4823	5540	21600	738
	14400											

① All ratings with an "A" dimension greater than 138 inches will be shipped with H.V. Bushings removed.

Customer _____ Address _____ G.O. _____
P.O. Number _____ Item _____ Line No. _____
Job _____ Approval ☐
Reference ☐
Certification by South Boston only. _____ Date _____ Construction or Installation ☐
Other ☐

Dimensions and Weights



Three Phase
60 Hertz, Oil, 55°C, OA/Future FA

High Voltage Rating	Low Voltage Rating	Kva Rating	Dimensions in Inches					Weights in Pounds				Oil Volume
			A①	B	C	D	F	Core and Coils	Tank and Fittings	Oil	Total	Gallons
	2400											
26400	2400Y											
34400	2520											
		1000	109	62	75	83	152	4082	2418	3400	9900	453
		1500	113	65	81	87	160	5183	2877	3740	11800	498
		2500	123	89	88	96	177	7481	3389	4530	15400	603
		3750	132	117	90	105	194	9795	4375	5430	19600	724
		5000	135	151	96	108	200	12122	5338	5940	23400	792
26400	4160Y	1000	110	67	68	84	154	4944	2546	3710	11200	494
34400	4360	1500	115	68	78	89	163	5831	2919	4050	12800	539
		2000	120	72	88	94	173	6877	3103	4320	14300	576
		2500	125	84	89	98	181	7595	3395	4710	15700	628
		3750	131	122	91	104	192	9901	4349	5550	19800	739
		5000	133	150	96	106	196	12665	5645	6390	24700	851
26400	4800	1000	106	62	73	80	146	3465	2225	3210	8900	427
34400	5040	1500	111	67	86	85	156	4481	2699	3520	10700	469
		2500	117	92	88	91	167	6504	3406	4090	14000	545
		3750	124	143	90	97	179	8728	4182	4890	17800	651
		5000	138	153	96	111	205	14334	5716	7050	27100	940
26400	6900	1000	106	62	73	80	146	3490	231	3200	9000	426
	7200											
34400	7560	1500	111	63	86	85	156	4480	2710	3510	10700	468
	8320Y	2500	117	92	88	91	167	6503	3407	4090	14000	545
	8720	3750	124	145	90	97	179	8727	4183	4890	17800	652
		5000	138	153	96	111	205	14344	5706	7050	27100	940
26400	12000	1000	109	62	71	83	152	3634	2356	3310	9300	441
	12470Y											
34400	12600	1500	112	64	82	86	158	4648	2762	3590	11000	478
	13090Y	2500	117	95	88	91	167	6567	3493	4140	14200	552
	13200											
	13200Y	3750	125	130	90	98	181	9033	4127	5340	18500	712
	13800Y	5000	131	152	96	104	192	11505	5235	5960	22700	794
	14400											
43800	2400	1000	120	70	74	82	152	5100	2900	4500	12500	600
	4160Y	1500	125	72	85	88	166	6300	3100	5200	14600	695
		2000	127	73	91	90	171	6900	3500	5300	15700	710
		2500	134	103	95	98	184	8100	3900	6000	18000	800
		3750	139	130	96	104	196	10200	5100	6800	22100	910
	4800	5000	143	138	96	110	208	13900	6200	8400	28500	1120
43800	7200	1000	117	67	75	78	145	3700	2600	3800	10100	510
	8320Y	1500	124	64	87	87	164	4900	3000	4150	12050	555
		2000	126	71	92	89	169	6000	3400	4700	14100	630
		2500	132	98	95	96	180	7300	3800	5100	16200	680
		3750	135	131	96	99	188	9100	4400	5900	19400	790
		5000	141	143	96	106	200	11600	5800	7100	24500	950
43800	13200	1000	119	65	74	81	150	3950	2600	3850	10400	515
	13800Y	1500	123	66	88	86	162	5000	3100	4300	12400	575
		2000	126	70	90	89	169	6400	3400	4700	14500	630
		2500	129	103	95	92	174	6800	3900	5000	15700	670
		3750	135	123	96	101	189	9800	4800	6500	21100	870
		5000	139	143	96	104	196	11600	5900	7100	24600	950
43800	22900	1000	118	65	75	79	147	4100	2700	3900	10700	520
		1500	121	68	89	84	158	5300	3200	4600	13100	615
		2000	128	73	93	91	172	6800	3600	5300	15700	710
		2500	135	98	95	99	188	7700	3900	5800	17400	775
		3750	137	128	96	102	193	9900	5000	6800	21700	910
		5000	143	141	96	109	206	12400	6100	7900	26400	1055

①All ratings with an "A" dimension greater than 138 inches will be shipped with H.V. Bushings removed.

These dimensions are for standard ratings as defined by standard electrical, mechanical, tests, etc. in Price List 47-220, dated September, 1975.

Further Information
Price List 47-220
Descriptive Bulletin 47-226

Customer _____ Address _____ G.O. _____

P.O. Number _____ Item _____ Line No. _____

Job _____ Approval ☐

_____ Reference ☐

Certification by South Boston only. _____ Date _____ Construction or Installation ☐

_____ Other ☐

Westinghouse Electric Corporation
Small Power Transformer Division
South Boston, VA 24592

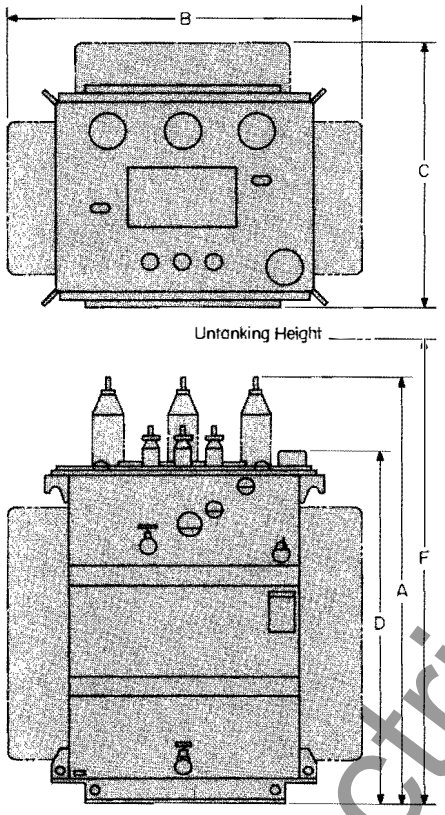
Printed in USA

Westinghouse Electric Corporation
Small Power Transformer Division
South Boston, VA 24592

August, 1975
New Information
E. D/2091/DB

Substation Transformers

Dimensions and Weight



Three Phase
60 Hertz, Oil, 55°C, OA/Future FA

High Voltage Rating	Low Voltage Rating	Kva Rating	Dimensions in Inches					Weights in Pounds				Oil Volume
			A①	B	C	D	F	Core and Coils	Tank and Fittings	Oil	Total	Gallons
43800	34500	1000	120	76	77	81	152	4600	3100	4950	12650	660
	34500Y	1500	123	76	89	85	161	6100	3800	5250	15150	700
		2000	128	78	91	91	171	7400	3900	5800	17100	775
		2500	130	105	95	94	177	8500	4300	6300	19100	840
		3750	137	133	96	102	193	10800	5300	7400	23500	990
		5000	143	144	96	108	204	13400	6300	8300	28000	1110
67000	2400	1000	128	82	68	84	159	5800	3700	6500	16000	870
	4160Y	1500	140	83	80	98	184	7200	4200	7000	18400	935
	4800	2000	144	82	91	102	192	8100	5000	7400	20500	990
		2500	148	98	96	106	200	9300	5000	7900	22200	1055
		3750	154	124	96	113	214	11500	6300	8900	26700	1190
		5000	156	141	96	114	215	15800	7900	9900	33600	1320
67000	7200	1000	130	82	68	86	162	4950	3850	6500	15300	870
	8320Y	1500	135	83	79	92	174	5950	4250	6700	16900	895
		2000	140	82	89	96	182	6900	5000	7200	19100	960
		2500	145	95	96	103	195	8000	4800	7100	19900	950
		3750	154	119	96	113	214	10900	5700	8500	25100	1135
		5000	156	142	96	114	215	15800	7600	10100	33500	1350
67000	13200	1000	132	84	72	87	165	4950	3900	6500	15350	870
	13800Y	1500	138	81	78	95	179	6100	4500	6750	17350	900
		2000	140	79	93	97	183	7100	4400	6900	18400	920
		2500	144	105	96	102	192	8000	5000	7100	20100	950
		3750	154	126	96	113	214	10900	6100	8800	25800	1175
		5000	154	145	96	113	214	12800	7550	9300	29650	1240
67000	22900	1000	129	77	72	85	160	5300	3700	6000	15000	800
		1500	140	78	80	99	186	6700	4200	6900	17800	920
		2000	140	79	95	98	184	7500	4700	7100	19300	950
		2500	145	102	96	103	194	9000	5200	7900	22100	1055
		3750	154	122	96	111	210	11200	6200	8900	26300	1190
		5000	156	142	96	114	215	13900	7700	9800	31400	1310
67000	34500	1000	133	80	73	90	169	5650	3900	6500	16050	870
	34500Y	1500	139	81	84	97	182	7150	4450	7400	19000	990
		2000	142	84	91	99	187	8500	5400	7750	21650	1035
		2500	147	99	96	106	199	10100	5700	8500	24300	1135
		3750	154	129	96	112	213	12400	7200	10000	29600	1335
		5000	156	142	96	114	215	15100	8000	10500	33600	1400

① All ratings with an "A" dimension greater than 138 inches will be shipped with H.V. Bushings removed.

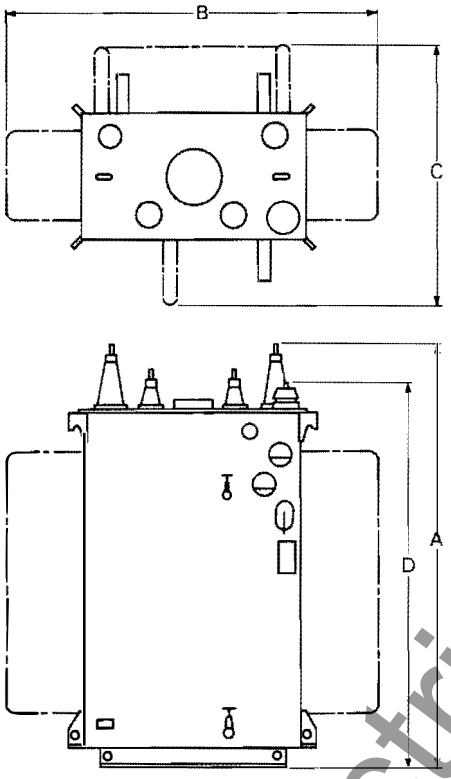
Customer _____ Address _____ G.O. _____
P.O. Number _____ Item _____ Line No. _____
Job _____ Approval ☐
Reference ☐
Certification by South Boston only. _____ Date _____ Construction or Installation ☐
Other ☐

September, 1975
Supersedes DS 48-175, page 3
dated August, 1975
E,D/2091/DB

Single Phase Substations
833 Kva to 3333 Kva
67 Kv and Below

Substation Transformers

Dimensions and Weights



These dimensions are for standard ratings as defined by standard electrical, mechanical, tests, etc. in Price List 47-220, dated September, 1975.

Further Information
Price List 47-220
Descriptive Bulletin 47-226

Single Phase
60 Hertz, Oil, 55°C, OA/Future FA

High Voltage Rating	Low Voltage Rating	Kva Rating	Dimensions in Inches				Weights in Pounds				Oil Volume
			A①	B	C	D	Core and Coils	Tank and Fittings	Oil	Total	Gallons
2400/4160Y		833	85	45	80	72	2350	1570	1750	5670	235
4800/8320Y	480	1250	89	67	84	76	3200	2000	2090	7290	278
6900/11950Y											
7200/12470Y											
7200/12470Y											
7620/13200Y	2400/4160Y										
12000	2520/4360Y	833	85	45	79	72	2740	1340	1830	5910	244
12470		1250	89	55	84	76	3560	1650	2100	7310	279
13200		1667	91	68	87	78	4280	2040	2290	8610	305
13800		2500	98	90	91	84	5730	2910	2860	11500	381
6900/11950Y		833	84	44	79	71	2450	1420	1640	5510	218
7200/12470Y	4800/8320Y										
7620/13200	5040/8720Y	1250	92	54	88	78	3960	2120	2330	8410	310
12000		1667	92	80	91	78	4790	2370	2640	9800	352
12470											
13200		2500	100	90	92	86	6260	3010	3130	12400	417
13800											
22900	480	833	99	44	77	82	2550	1610	2300	6460	306
		1250	104	53	88	87	3350	2350	2550	8250	340
22900	2400/4160Y	833	96	44	74	79	2480	1440	1990	5910	265
	2520/4360Y	1250	103	49	87	86	3740	2300	2570	8610	342
		1667	105	58	87	88	4350	2620	2740	9710	365
		2500	112	71	92	95	6400	2890	3420	12700	455
2290	7620/13200Y	833	97	45	77	80	2520	1480	2170	6170	289
		1250	101	49	85	84	3545	2205	2550	8300	340
		1667	105	58	89	88	4270	2630	2910	9810	388
		2500	108	77	92	91	5800	3020	3290	12100	438
		3333	115	89	97	98	8370	3170	4470	16010	596
34500	480	833	113	44	77	87	2610	1740	2460	6810	328
34500	2400	833	113	49	65	86	3140	2000	2770	7910	369
		1250	116	51	77	89	3990	2400	3120	9510	416
		1667	121	52	87	94	4650	2740	3420	10810	455
		2500	123	69	94	96	6140	3350	3920	13410	522
34500	7620	833	110	44	75	84	2450	1590	2370	6410	315
		1250	115	48	87	88	3340	2380	2790	8510	372
		1667	122	54	89	96	5370	2690	3850	11910	513
		2500	122	75	93	98	5410	3200	3865	12475	515
		3333	130	93	95	102	8160	3280	4670	16110	622
43800	480	833	111	53	86	74	2640	1840	2030	6510	270
		1250	115	72	87	79	3360	2060	2190	7610	292
43800	2400	833	115	49	69	88	3220	2150	3240	8610	431
		1250	117	50	84	90	3810	2600	3500	9910	466
		1667	117	63	90	90	4540	2820	3560	10900	475
		2500	121	86	93	90	6070	3170	3750	12990	500
43800	7200	833	109	45	83	72	2430	1600	1880	5910	250
		1250	115	55	89	79	3440	2290	2280	8010	304
		1667	115	67	91	80	4300	2650	2760	9710	368
		2500	122	82	95	88	6570	3140	3700	13410	493
		3333	128	103	97	94	8420	3420	4170	16010	556

① All ratings with an "A" dimension greater than 138 inches will be shipped with H.V. Bushings removed.

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Certification by South Boston only. _____ Date _____ Construction or Installation ☐
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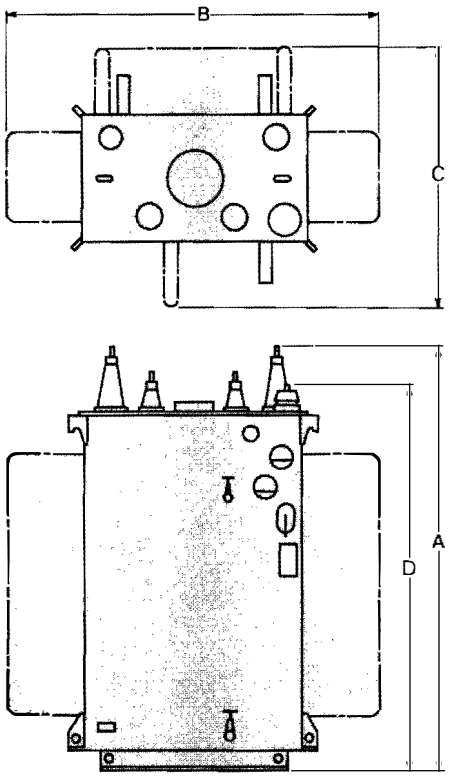
Dimensions and Weights



Single Phase
60 Hertz, Oil 55°C OA/Future FA

High Voltage Rating	Low Voltage Rating	Kva Rating	Dimensions in Inches					Weights in Pounds				Oil Volume
			A①	B	C	D	F	Core and Coils	Tank and Fittings	Oil	Total	Gallons
67000	2400	833	134	46	81	94	172	3100	2700	3300	9100	440
		1250	138	53	80	100	186	4500	2900	3900	11300	520
		1667	137	61	86	99	183	5300	3200	3800	12300	505
		2500	144	86	95	106	196	6800	3700	4000	14500	535
		3333	148	98	94	110	204	8400	4600	4500	17500	600
67000	4800	833	126	60	92	88	163	3100	2500	3100	8700	415
		1250	132	61	92	94	174	4000	3000	3400	10400	455
		1667	141	55	89	103	190	5800	3100	4300	13200	575
		2500	143	68	98	105	194	7400	4200	4700	16300	625
		3333	144	92	101	106	196	7800	5100	4400	18300	585
67000	6900	833	126	50	77	88	161	3200	2400	3200	8800	425
		1250	132	51	85	94	174	4100	2800	3500	10400	465
		1667	134	60	90	96	177	5000	3200	3900	12100	520
		2500	145	72	98	107	196	7000	4300	4100	15400	545
		3333	146	90	99	108	200	9200	4500	5500	19200	735
67000	7200	833	127	50	77	88	162	3200	2400	3200	8800	425
		1250	130	59	87	91	168	4000	2900	3400	10300	455
		1667	139	53	93	101	187	5100	3100	4100	12300	545
		2500	145	71	97	107	196	7100	4200	4300	15200	575
		3333	146	88	99	108	200	9300	4500	5600	19400	745
67000	13200	833	128	48	81	89	164	3100	2500	3200	8800	425
		1250	131	51	87	93	171	4100	2800	3400	10300	455
		1667	134	60	90	96	177	4900	3100	3700	11700	495
		2500	143	70	95	105	194	6500	3700	4400	14600	585
		3333	143	95	100	105	194	8200	4800	5000	18000	665

Westinghouse Electric Corporation
Small Power Transformer Division
South Boston, VA 24592