

Transformer 3

POWER TRANSFORMER DEPARTMENT



PITTSFIELD, MASS.

Date of Test March 1975

REPORT OF TEST ON TRANSFORMERS

Purchaser: [REDACTED]

RATING: **\*\*120000/160000/200000(Output)KVA**

H - Winding	X - Winding	Y - Winding	Purchaser's Order G. E. Req'n. No. _____ G. E. Contract No. _____
230000GRY/128750	69000GRY/39840	13800	
**	**	29000//48300	

Tags as per attached Nameplate. **268276**

CHARACTERISTICS

Losses, efficiencies and regulations are based on wattmeter measurements and, unless otherwise stated, on normal rating. For three phase transformers the resistances given are the sum of the three phases.

	Resistance at 35 C			NO LOAD LOSS WATTS AT 100% VOLTAGE	% EXCIT. CURRENT AT 100% VOLTAGE	223GRY Kv		223GRY Kv		69GRY Kv	
	H	X	Y			To 69GRY Kv	To 13.8 Kv	To 13.8 Kv	To 13.8 Kv	To 13.8 Kv	To 13.8 Kv
	At 120000 Kva		At 29000 Kva			At 29000 Kva		At 29000 Kva		At 29000 Kva	
	1.288	0.1626	0.1741	98450	0.539	230770	6.19	10.39	13.87		
AVERAGE				98000	0.6		6.20				
GUARANTEE						329220					
Load Loss Wm at 35 C						335000					
EFFICIENCIES AT 35C 100% P.F.						REGULATION AT 35C					
	Load	Full Load	1/2 Load	1/4 Load	1/4 Load	100% P-F	90% P-F	80% P-F	70% P-F		
AVERAGE		99.72	99.74	99.73	99.62	AVERAGE 0.383	3.02	3.98			
GUARANTEE		99.72	99.74	99.71	99.63	GUARANTEE 0.4	-	4.0			

TEMPERATURE RISE (Serial No. \_\_\_\_\_)

Average ultimate temperature rise in deg C corrected to instant of shutdown

	H - Winding		X - Winding		Y - Winding		Method of cooling	
Winding Connection	223000	V.	61275	V.	13800	V.	OA	
MVA Amp.	120	311	120	1116	29	1213	Top oil rise	56.4 C
Test Guar.	58.7 C	65 C	59.3 C	65 C	62.2 C	65 C	Ambient	25.0 C
Winding Temp. Ind.	deg C		deg C		deg C			
Winding Connection	223000	V.	61275	V.	13800	V.	FOA	
MVA Amp.	200	518	200	1674	49.3	2030	Top oil rise	32.7 C
Test Guar.	59.0 C	65 C	61.5 C	65 C	57.1 C	65 C	Ambient	25.0 C
Winding Temp. Ind.	deg C		deg C		deg C			

DIELECTRIC TESTS

APPLIED POTENTIAL TEST	VOLTAGE OF WINDING TESTED	TEST VOLTAGE APPLIED	DURATION IN SECONDS
Voltage applied to each winding in turn with all other windings connected to core and ground. Line Terminal To Ground	H	50000	60 seconds for all tests
	X	50000	
	Y	34000	

Induced voltage test 325KV/HV on 223GRY winding for 7200 cycles

Remarks: \*Temperature values are based on design data obtained from thermally similar transformers.

POWER TRANSFORMER DEPARTMENT  
**GENERAL ELECTRIC**  
 PITTSFIELD, MASS.

Additional Test Data

Additional Resistances @ 75°C

<u>Connection</u>	<u>Test</u>
75900Y	.1844
62100Y	.1860
Ser. U Exc. Wdg.	.9860

Insulation Power Factor Tests

<u>H &amp; X - Grd.</u>	<u>Y - Grd.</u>	<u>Temp. °C</u>
0.20	0.22	22.0

Tap Impedances

<u>Connection</u>	<u>KVA</u>	<u>% Volts</u>	<u>Watts</u>	<u>Temp. °C</u>
223000Y-75900Y	120000	6.47	191400	23.6
223000Y-62100Y	120000	6.03	244800	23.7
75900Y-13800	29000	13.92	141100	25.5
62100Y-13800	29000	13.43	142900	25.6

Voltage Ratios

<u>Connection</u>	<u>Calculated</u>	<u>Test</u>		
		<u>Phase 1</u>	<u>Phase 2</u>	<u>Phase 3</u>
223000-75965	2.9356	2.9337	2.9367	2.9375
223000-75550	2.9517	2.9510	2.9533	2.9548
223000-75125	2.9624	2.9665	2.9695	2.9703
223000-74705	2.9851	2.9843	2.9867	2.9882
223000-74280	3.0021	3.0003	3.0033	3.0042
223000-73950	3.0196	3.0183	3.0215	3.0227
223000-73420	3.0373	3.0363	3.0393	3.0402
223000-72985	3.0554	3.0549	3.0580	3.0589
223000-72550	3.0737	3.0727	3.0758	3.0763
223000-72110	3.0925	3.0921	3.0949	3.0962
223000-71670	3.1115	3.1101	3.1129	3.1139
223000-71225	3.1309	3.1307	3.1335	3.1348
223000-70780	3.1506	3.1493	3.1522	3.1535
223000-70330	3.1708	3.1705	3.1733	3.1746
223000-69890	3.1912	3.1898	3.1926	3.1940
223000-69475	3.2121	3.2118	3.2147	3.2160
223000-69000	3.2319	3.2319	3.2349	3.2361
223000-68510	3.2550	3.2546	3.2575	3.2588
223000-68050	3.2770	3.2757	3.2790	3.2803
223000-61275	3.6393	3.6381	3.6418	3.6432
223000-13800	16.1594	16.1863	16.2008	16.2190
69000-13800	5.0000	5.0111	5.0132	5.0162

Polarity and phase relation checked out OK.

(Continued on Page #3)

POWER TRANSFORMER DEPARTMENT  
**GENERAL ELECTRIC**

PITTSFIELD, MASS.

To check the calibration of the winding temperature indicators the following information may be used.

<u>CT</u>	<u>Current To Apply For 30 Minutes</u>	<u>Terminals</u>	<u>Rise Over 25°C Oil</u>	<u>Resistance(Ohms)</u>
A	32.4	X1 - Xo G	39.5	.170
B	32.0	X2 - Xo G	40.1	.070
C	30.3	X3 - Xo G	39.1	.170

These values will be approximately 3°C higher in 0°C top oil and 3°C lower in 50°C top oil. The resistors should be in place for all tests.

# GENERAL ELECTRIC



## AUTO TRANSFORMER

CLASS 9A/FA/FOA THREE-PHASE 60 HERTZ

VOLTAGE RATING 230000R, V/12750-60000R, V/3150-1100R  
 KVA RATING 12000 (OUTPUT) CONTINUOUS 45 C RISE SELF-COOLED  
 KVA RATING 16000 (OUTPUT) CONTINUOUS 45 C RISE FORCED-AIR-COOLED  
 KVA RATING 20000 (OUTPUT) CONTINUOUS 45 C RISE FORCED-OIL AND FORCED-AIR-COOLED

LINE TO LINE	LINE TO NEUTRAL	MECHANISM	DIAL POS.	CONNECTIONS
7125	1525	L	1	L
7150	1550	L	2	L
7175	1575	L	3	L
7200	1600	L	4	L
7225	1625	L	5	L
7250	1650	L	6	L
7275	1675	L	7	L
7300	1700	L	8	L
7325	1725	L	9	L
7350	1750	L	10	L
7375	1775	L	11	L
7400	1800	L	12	L
7425	1825	L	13	L
7450	1850	L	14	L
7475	1875	L	15	L
7500	1900	L	16	L
7525	1925	L	17	L
7550	1950	L	18	L
7575	1975	L	19	L
7600	2000	L	20	L
7625	2025	L	21	L
7650	2050	L	22	L
7675	2075	L	23	L
7700	2100	L	24	L
7725	2125	L	25	L
7750	2150	L	26	L
7775	2175	L	27	L
7800	2200	L	28	L
7825	2225	L	29	L
7850	2250	L	30	L
7875	2275	L	31	L
7900	2300	L	32	L
7925	2325	L	33	L
7950	2350	L	34	L
7975	2375	L	35	L
8000	2400	L	36	L
8025	2425	L	37	L
8050	2450	L	38	L
8075	2475	L	39	L
8100	2500	L	40	L
8125	2525	L	41	L
8150	2550	L	42	L
8175	2575	L	43	L
8200	2600	L	44	L
8225	2625	L	45	L
8250	2650	L	46	L
8275	2675	L	47	L
8300	2700	L	48	L
8325	2725	L	49	L
8350	2750	L	50	L
8375	2775	L	51	L
8400	2800	L	52	L
8425	2825	L	53	L
8450	2850	L	54	L
8475	2875	L	55	L
8500	2900	L	56	L
8525	2925	L	57	L
8550	2950	L	58	L
8575	2975	L	59	L
8600	3000	L	60	L

ITEM	H1	H2	H3	NEUTRAL ON H100
VOLTS	12750	15250	17750	23000
KVA	12000	16000	20000	24000

ITEM	H1	H2	H3	NEUTRAL ON H100
VOLTS	4818	5818	6818	8818
KVA	12000	16000	20000	24000

ITEM	H1	H2	H3	NEUTRAL ON H100
VOLTS	12750	15250	17750	23000
KVA	12000	16000	20000	24000

SUITABLE FOR OPERATION WITH THE NEUTRAL EITHER SOLIDLY GROUND OR GROUND THROUGH AN IMPEDANCE WHICH WILL LIMIT THE LOW FREQUENCY AND IMPULSE VOLTAGES FROM NEUTRAL TO GROUND TO VALUES CONSISTENT WITH THE INSULATION LEVELS SHOWN ON THIS NAMEPLATE.

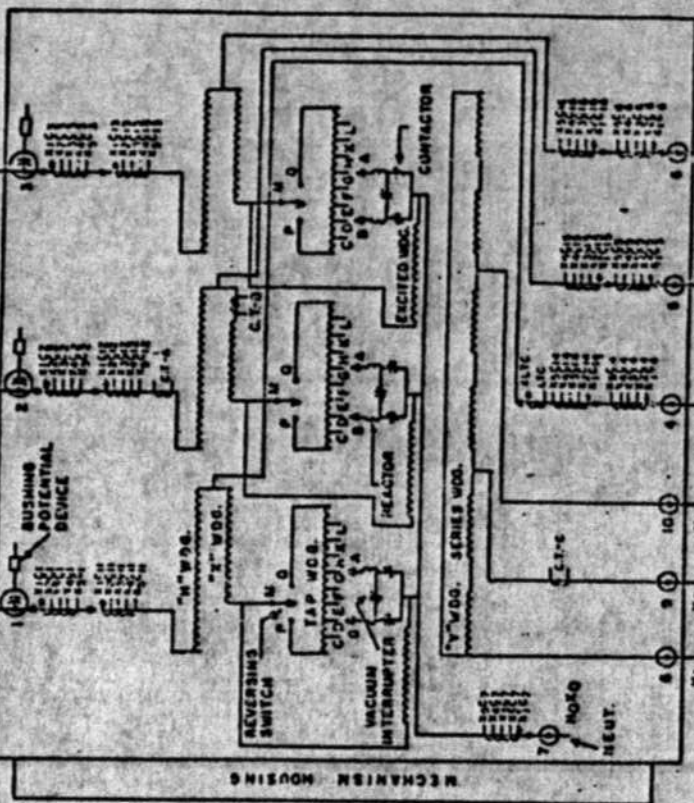
TRANSFORMER OPERATING PRESSURE RANGE IS 0.5 PSI POSITIVE TO 8 PSI.

TRANSFORMER TANK SUITABLE TO WITHSTAND 5 PSI PRESSURE AND FULL VACUUM WITH ALL TANK DRACING IN PLACE.

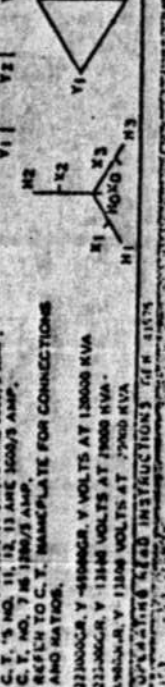
C.T. NO. 11, 12, 13 ARE 3000'S AMP.

C.T. NO. 7 IS 1000'S AMP.

REF. TO C.T. NAMEPLATE FOR CONNECTIONS AND RATINGS.

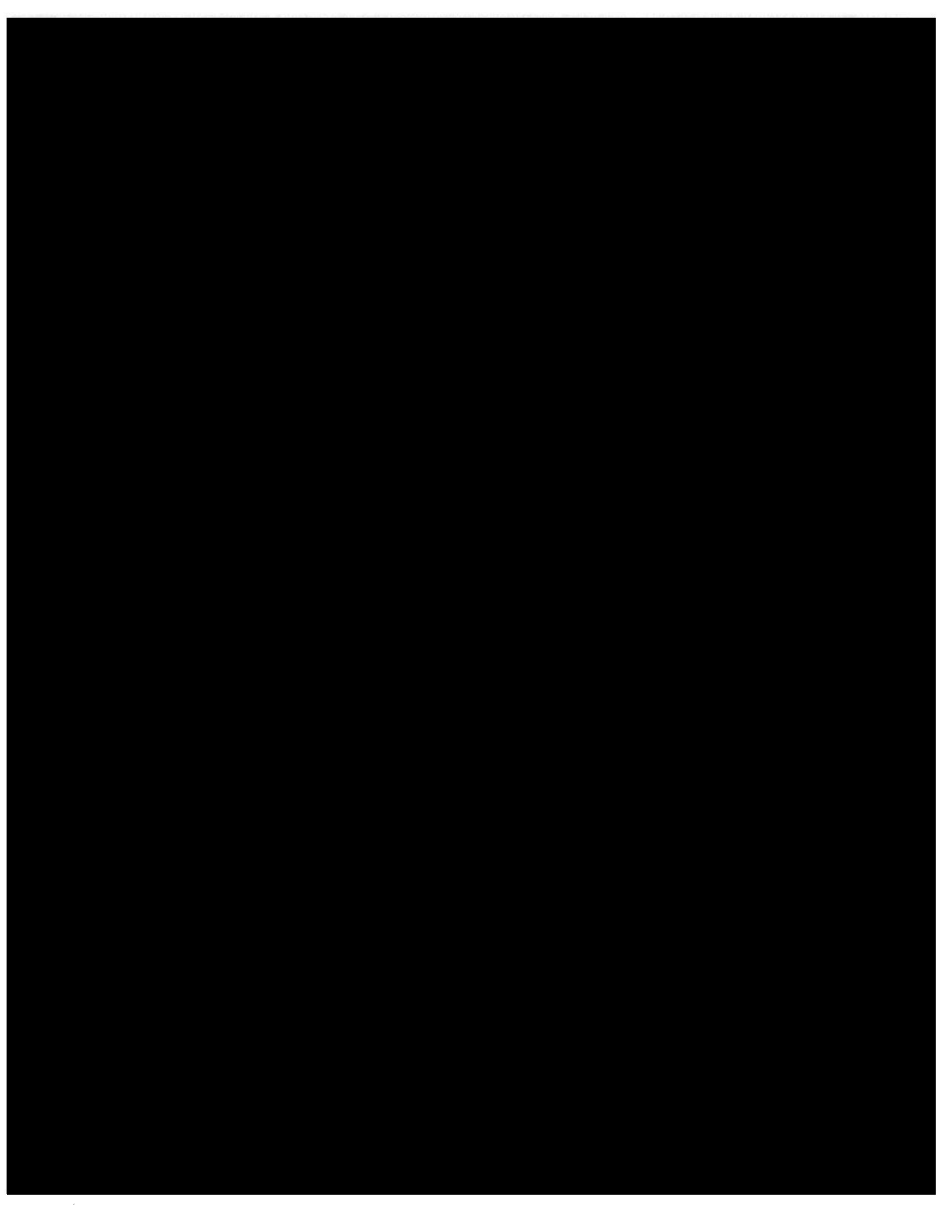


APPROX. WEIGHTS IN POUNDS  
 WHEN UNTANKING  
 TANK AND FITTINGS 18700  
 MAIN TANK NO. 10-C OIL 19700 GAL. 146300  
 MECH HOUS NO. 10-C OIL 500 GAL. 3700



INDICATING THERMAL RELAYS, PER CENT IMPEDANCE VOLTS  
 PER CENT IMPEDANCE VOLTS  
 PER CENT IMPEDANCE VOLTS  
 PER CENT IMPEDANCE VOLTS

CAUTION: ALWAYS OBSERVE OPERATING AND INSTRUCTIONS FOR THIS



Transformer 3

**POWER TRANSFORMER DEPARTMENT**  
**GENERAL ELECTRIC**  
 PITTSFIELD, MASS.

Date of Test March 1975

**REPORT OF TEST ON TRANSFORMERS**

Purchaser

RATING **\*\*120000/160000/200000(Output)KVA**

H - Winding		X - Winding		Y - Winding	
Volts	<b>230000GRY/128750</b>	<b>69000GRY/39840</b>		<b>13800</b>	
Kva	<b>**</b>	<b>**</b>		<b>29000//48300</b>	

Purchaser's Order  
 G. E. Req'n. No.  
 G. E. Contract No.

Taps as per attached Nameplate **268276**

**CHARACTERISTICS**

Losses, efficiencies and regulations are based on wattmeter measurements and, unless otherwise stated, on normal rating.  
 For three phase transformers the resistances given are the sum of the three phases.

	Resistance at 55 C			NO LOAD LOSS WATTS AT 100% VOLTAGE	% EXCIT. CURRENT AT 100% VOLTAGE	223GRY Kv		223GRY Kv		69GRY Kv		
	H	X	Y			To	Kv	To	Kv	To	Kv	Kv
						At	Kva	At	Kva	At	Kva	
	1.288	0.1626	0.1741	98450	0.539	230770	6.19		10.39		13.87	
AVERAGE												
GUARANTEE				98000	0.6		6.20					
Total Loss Watts at 55 C				AVERAGE		329220						
				GUARANTEE		335000						
EFFICIENCIES AT 55C 100% P-F	Load	Full Load	3/4 Load	1/2 Load	1/4 Load	REGULATION AT 55C						
						AVERAGE		100% P-F	90% P-F	80% P-F	70% P-F	
						GUARANTEE		0.4	-	4.0		
AVERAGE		99.72	99.74	99.73	99.62	AVERAGE		0.383	3.02	3.98		
GUARANTEE		99.72	99.74	99.74	99.63	GUARANTEE		0.4	-	4.0		

**TEMPERATURE RISE (Serial No. \* )**

Average ultimate temperature rise in deg C corrected to instant of shutdown

		H - Winding		X - Winding		Y - Winding			
Winding Connection		223000	v.	61275	v.	13800	v.	Method of cooling	OA
MVA	Amp.	120	311	120	1116	29	1213	Top oil rise	56.4 C
Rise Test	Guar.	58.7 C	65 C	59.3 C	65 C	62.2 C	65 C	Ambient	25.0 C
Winding Temp. Ind.		deg C		deg C		deg C			
Winding Connection		223000	v.	61275	v.	13800	v.	Method of cooling	FOA
MVA	Amp.	200	518	200	1674	48.3	2030	Top oil rise	32.7 C
Rise Test	Guar.	59.0 C	65 C	61.5 C	65 C	57.1 C	65 C	Ambient	25.0 C
Winding Temp. Ind.		deg C		deg C		deg C			

**DIELECTRIC TESTS**

**APPLIED POTENTIAL TEST**


Voltage applied to each winding in turn with all other windings connected to core and ground.

Line Terminal To Ground

VOLTAGE OF WINDING TESTED	TEST VOLTAGE APPLIED	DURATION IN SECONDS
H	50000	60 seconds for all tests
X	50000	
Y	34000	

Induced voltage test 325KV/HV ~~INDUCED VOLTAGE TEST~~ for 7200 cycles

Remarks

**POWER TRANSFORMER DEPARTMENT**  
**GENERAL  ELECTRIC**  
**PITTSFIELD, MASS.**

Additional Test Data

Additional Resistances @ 75°C

<u>Connection</u>	<u>Test</u>
75900Y	.1844
62100Y	.1860
Ser. U Exc. Wdg.	.9860

Insulation Power Factor Tests

<u>H &amp; X - Grd.</u>	<u>Y - Grd.</u>	<u>Temp. °C</u>
0.20	0.22	22.0

Tap Impedances

<u>Connection</u>	<u>KVA</u>	<u>% Volts</u>	<u>Watts</u>	<u>Temp. °C</u>
223000Y-75900Y	120000	6.47	191400	23.6
223000Y-62100Y	120000	6.03	244800	23.7
75900Y-13800	29000	13.92	141100	25.5
62100Y-13800	29000	13.43	142900	25.6

Voltage Ratios

<u>Connection</u>	<u>Calculated</u>	<u>Test</u>		
		<u>Phase 1</u>	<u>Phase 2</u>	<u>Phase 3</u>
223000-75965	2.9356	2.9337	2.9367	2.9375
223000-75550	2.9517	2.9510	2.9533	2.9548
223000-75125	2.9684	2.9665	2.9695	2.9703
223000-74705	2.9851	2.9843	2.9867	2.9882
223000-74280	3.0021	3.0003	3.0033	3.0042
223000-73850	3.0196	3.0188	3.0215	3.0227
223000-73420	3.0373	3.0363	3.0393	3.0402
223000-72985	3.0554	3.0549	3.0580	3.0589
223000-72550	3.0737	3.0727	3.0758	3.0763
223000-72110	3.0925	3.0921	3.0949	3.0962
223000-71670	3.1115	3.1101	3.1129	3.1139
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223000-70330	3.1708	3.1705	3.1733	3.1746
223000-69880	3.1912	3.1898	3.1926	3.1940
223000-69475	3.2121	3.2118	3.2147	3.2160
223000-69000	3.2319	3.2319	3.2349	3.2361
223000-68510	3.2550	3.2546	3.2575	3.2588
223000-68050	3.2770	3.2757	3.2790	3.2803
223000-61275	3.6393	3.6381	3.6418	3.6432
223000-13800	16.1594	16.1863	16.2008	16.2190
69000-13800	5.0000	5.0111	5.0132	5.0162

Polarity and phase relation checked out OK.

(Continued on Page #3)

POWER TRANSFORMER DEPARTMENT  
**GENERAL ELECTRIC**  
PITTSFIELD, MASS.

To check the calibration of the winding temperature indicators the following information may be used.

<u>CT</u>	<u>Current To Apply For 30 Minutes</u>	<u>Terminals</u>	<u>Rise Over 25°C Oil</u>	<u>Resistance (Ohms)</u>
A	32.4	X1 - Xo G	39.5	.170
B	32.0	X2 - Xo G	40.1	.070
C	30.3	X3 - Xo G	39.1	.170

These values will be approximately 3°C higher in 0°C top oil and 3°C lower in 50°C top oil. The resistors should be in place for all tests.



# GENERAL ELECTRIC

## AUTOTRANSFORMER

CLASS 0A/FA/FOA  
THREE-PHASE  
60 HERTZ

VOLTADE RATING 2230000VA, Y/123750-890000VA, Y/9180-13900  
 KVA RATING 120000 (OUTPUT) CONTINUOUS 65 C RISE SELF-COOLED  
 KVA RATING 180000 (OUTPUT) CONTINUOUS 65 C RISE FORCED-AIR-COOLED  
 KVA RATING 280000 (OUTPUT) CONTINUOUS 65 C RISE FORCED-OIL AND FORCED-AIR-COOLED

LINE TO	200000 KVA	DIAL POS.	MECHANISM CONNECTIONS
71945	1520	31	L L L
71950	1520	32	L L L
71955	1520	33	L L L
71960	1520	34	L L L
71965	1520	35	L L L
71970	1520	36	L L L
71975	1520	37	L L L
71980	1520	38	L L L
71985	1520	39	L L L
71990	1520	40	L L L
71995	1520	41	L L L
72000	1520	42	L L L
72005	1520	43	L L L
72010	1520	44	L L L
72015	1520	45	L L L
72020	1520	46	L L L
72025	1520	47	L L L
72030	1520	48	L L L
72035	1520	49	L L L
72040	1520	50	L L L
72045	1520	51	L L L
72050	1520	52	L L L
72055	1520	53	L L L
72060	1520	54	L L L
72065	1520	55	L L L
72070	1520	56	L L L
72075	1520	57	L L L
72080	1520	58	L L L
72085	1520	59	L L L
72090	1520	60	L L L
72095	1520	61	L L L
72100	1520	62	L L L
72105	1520	63	L L L
72110	1520	64	L L L
72115	1520	65	L L L
72120	1520	66	L L L
72125	1520	67	L L L
72130	1520	68	L L L
72135	1520	69	L L L
72140	1520	70	L L L
72145	1520	71	L L L
72150	1520	72	L L L
72155	1520	73	L L L
72160	1520	74	L L L
72165	1520	75	L L L
72170	1520	76	L L L
72175	1520	77	L L L
72180	1520	78	L L L
72185	1520	79	L L L
72190	1520	80	L L L
72195	1520	81	L L L
72200	1520	82	L L L
72205	1520	83	L L L
72210	1520	84	L L L
72215	1520	85	L L L
72220	1520	86	L L L
72225	1520	87	L L L
72230	1520	88	L L L
72235	1520	89	L L L
72240	1520	90	L L L
72245	1520	91	L L L
72250	1520	92	L L L
72255	1520	93	L L L
72260	1520	94	L L L
72265	1520	95	L L L
72270	1520	96	L L L
72275	1520	97	L L L
72280	1520	98	L L L
72285	1520	99	L L L
72290	1520	100	L L L

INDICATING THERMAL RELAYS  
 C.T.'S A, C ARE FOR USE WITH  
 PER CENT 2230000VA, Y-490000VA, Y VOLTS AT 15000 KVA  
 PER CENT 180000VA, Y-13900VA, Y VOLTS AT 15000 KVA  
 PER CENT 280000VA, Y-13900VA, Y VOLTS AT 15000 KVA  
 PER CENT 180000VA, Y-13900VA, Y VOLTS AT 15000 KVA

LINE TO	H1, H2, H3	NEUTRAL ON H0X0
223000		
223005		
223010		
223015		
223020		
223025		
223030		
223035		
223040		
223045		
223050		
223055		
223060		
223065		
223070		
223075		
223080		
223085		
223090		
223095		
223100		
223105		
223110		
223115		
223120		
223125		
223130		
223135		
223140		
223145		
223150		

SUITABLE FOR SIMULTANEOUS THREE-WINDING OPERATION PROVIDED THAT THE KVA RATING OF ANY PARTICULAR SET OF TERMINALS IS NOT EXCEEDED, THAT THE ARITHMETICAL SUM OF THE OUTPUTS DOES NOT EXCEED 200000 KVA AND THAT THE CURRENT IN THE COMMON WINDING DOES NOT EXCEED 1214 AMPERES.

SUITABLE FOR OPERATION WITH THE NEUTRAL EITHER SOLIDLY GROUND OR GROUND THROUGH AN IMPEDANCE WHICH WILL LIMIT THE LOW FREQUENCY AND IMPULSE VOLTAGES FROM THE NEUTRAL TO GROUND TO VALUES CONSISTENT WITH THE INSULATION LEVELS SHOWN ON THIS NAMEPLATE.

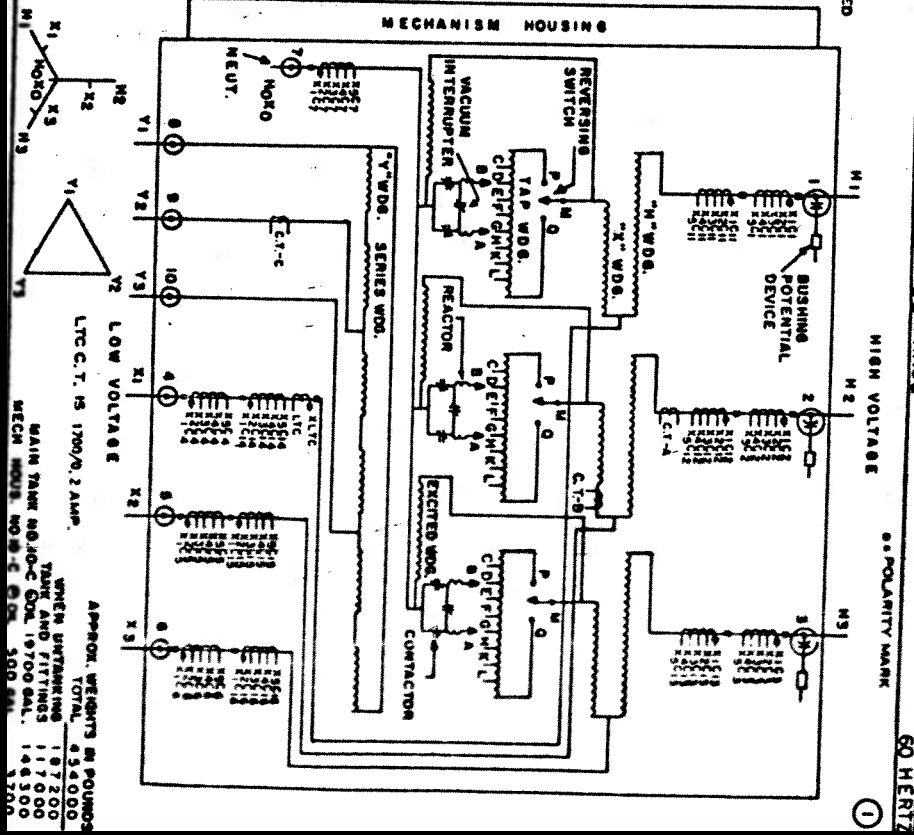
TRANSFORMER OPERATING PRESSURE RANGE IS 0.8 PSI POSITIVE TO 0 PSI.

TRANSFORMER TANK SUITABLE TO WITHSTAND 5 PSI PRESSURE AND FULL VACUUM WITH ALL TANK BRACING IN PLACE.

C.T.'S NO.1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16 ARE 2000/5 AMP.

C.T.'S NO. 11, 12, 13 ARE 2000/5 AMP.

C.T.'S NO. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16 REFER TO C.T. NAMEPLATE FOR CONNECTIONS AND RATINGS.



APPROX. WEIGHTS IN POUNDS  
 TANK AND FITTINGS 187200  
 MAIN TANK 8030-C 1700 GAL. 146500  
 MECH. H0X0-C 1500 GAL. 1700

# AUTO TRANSFORMERS

TOP OIL TEMP. 70°C

DATE 2-11-76

AIR TEMP. 76°F

WEATHER cloudy

% HUMIDITY 81%

TRANSFORMER G-E T-1000

MFR G-E

TYPE 20

FORM

CLASS 0A/1EA/1E0A

KVA 20000

HIGH SIDE KV 223 Y

LOW SIDE KV 69 Y

TELT. SIDE KV 13.8 Y

BUSINGS

MFR	TYPE	FORM	CLASS
GE	U		
GE	U	11762	
GE	U	AT 23	

KV AMP. YEAR

220 800 1975

11 2000 1975

11 2000 1975

COPIES TO:

DATE LAST TEST 11/1/75

## OVERALL TESTS

TEST	TEST CONNECTIONS			TEST KV	EQUIVALENT 10 KV READINGS						% POWER FACTOR		KEY TO INSULATION RATING	INSULATION RATING
	WINDING ENERGIZED	WINDING BOUNDED	WINDING GUARDED		MICROAMPERES			WATTS			MEASURED	COR. 20°C		
					METER READING	MULTIPLIER	MICRO-AMPERES	METER READING	MULTIPLIER	WATTS				
1	HIGH LOW	TEST		10	96	2	192	6	1	6				
2	HIGH LOW		TEST	10	90	2	180	5.5	1	5.5	.30	.27		W1-
3	TEST	HIGH LOW		10	50	1	50	10	.2	2.0				W1-
4	TEST		HIGH LOW	10	65	1	65	9	.2	1.8	.26	.23		W1-
CALCULATED RESULTS							12			.5	.41	.267		W1-
							12			.2				W1-

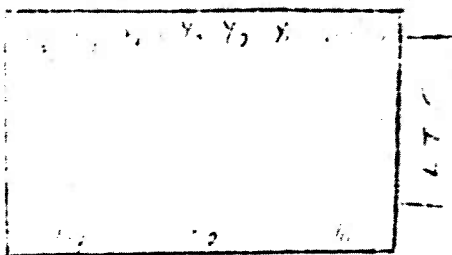
\*CURRENT AND WATTS SHOULD COMPARE WITH THOSE FOR C<sub>W</sub>

## BUSHING TESTS

LINE NO.	BUSH. NO.	PHASE	TEST KV	EQUIVALENT 10 KV READINGS						% POWER FACTOR		COLLAR TESTS (WATTS/CURRENT)		INSULATION RATING
				METER READING	MULTIPLIER	MICRO-AMPERES	METER READING	MULTIPLIER	WATTS	MEASURED	COR. 20°C	TOP		
1	H <sub>1</sub>		10	66	20	1320	2.5	.01	.025	.21			G	
2	H <sub>2</sub>		10	65	20	1300	4	.01	.04	.30			G	
3	H <sub>3</sub>		10	17	20	340	4	.01	.04	.29			G	
4	Y <sub>1</sub>		10	SEE MISC. SHEET										
5	Y <sub>2</sub>		10	67	20	1340	4	.01	.04	.11			G	
6	Y <sub>3</sub>		10	SEE MISC. SHEET										
7	H <sub>1</sub> Y <sub>1</sub>		10	64	20	1280	9	.01	.09	.53			G	
8	Y <sub>1</sub>		10	21	.1	2.1	3	.02	.06	.20			F-	
9	Y <sub>2</sub>		10	20	.1	2.0	3	.02	.06	.30			F-	
10	Y <sub>3</sub>		10	20	.1	2.0	3	.02	.06	.20			F-	
11	N		CIRCUIT TEST BY X WINDING ENERGIZED											
12			8	67	1	67					X <sub>1</sub>	X <sub>2</sub>	V <sub>2</sub>	
13			8	58	1	58					X <sub>2</sub>	X <sub>2</sub>		
14	OIL TEMP		8	53	2	106					X <sub>2</sub>	X <sub>2</sub>		

N = NEUTRAL

### DIAGRAM



# INSULATION TESTS MISCELLANEOUS EQUIPMENT

NO. 876J

DATE 2-11-76  
 AIR TEMP. 76°F OIL TEMP. \_\_\_\_\_  
 WEATHER Cloudy % HUM. \_\_\_\_\_  
 DATE LAST TEST 11/17/76  
 LAST TEST SHEET NO. 417191

LINE NO.	TEST KV	EQUIVALENT 10 KV READINGS						% POWER FACTOR		INSULATION RATING
		MICROAMPERES			WATTS			MEASURED	COR. 20°	
		METER READING	MULTIPLIER	MICRO-AMPERES	METER READING	MULTIPLIER	WATTS			
1		HIGH SIDE 197 KV								
2										
3	10	21	10	210	24	002	048			
4	10	22	10	220	18	002	036			
5	10	21	10	210	5	01	05			
6										
7		LOW SIDE 60 KV								
8										
9	10	12	10	120	10	002	120			
10	10	12	10	120	60	002	120			
11	10	12	10	120	65	002	130			
12										
13		5007 15 KV								
14										
15	10	7.5	10	75	76	07	152			
16	10	7.5	10	75	76	07	152			
17	10	17	10	170	73	07	106			
18										
19										
20										
21										
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25										
26										
27										
28										
29										

# Transformer 3

POWER TRANSFORMER DEPARTMENT  
**GENERAL ELECTRIC**  
 PITTSFIELD, MASS.

Date of Test March 1975

## REPORT OF TEST ON TRANSFORMERS

Purchaser: [REDACTED]  
 RATING **\*\*120000/160000/200000 (Output) KVA**

M Winding	X Winding	Y Winding
Volts <b>230000GRY/128750</b>	<b>69000GRY/39840</b>	<b>13800</b>
Kva <b>**</b>	<b>**</b>	<b>29000//48300</b>

Purchaser's Order No. [REDACTED]  
 G. E. Req'n. No. [REDACTED]  
 G. E. Contract No. [REDACTED]

Taps as per attached Nameplate **268276**

### CHARACTERISTICS

Losses, efficiencies and regulations are based on wattmeter measurements and, unless otherwise stated, on normal rating.  
 For three phase transformers the resistances given are the sum of the three phases.

Serial	Resistance at 35 C			NO LOAD LOSS WATTS AT 100% VOLTAGE	% EXCIT. CURRENT AT 100% VOLTAGE	223GRY Kv		223GRY Kv		69GRY Kv	
	H	X	Y			To 69GRY Kv	To 13.8 Kv	To 13.8 Kv	To 13.8 Kv	To 13.8 Kv	To 13.8 Kv
	1.288	0.1626	0.1741	98450	0.539	At 120000 Kva	At 29000 Kva	At 29000 Kva	At 29000 Kva	At 29000 Kva	At 29000 Kva
						LOAD LOSS WATTS 75 C	% IMP. 75 C	LOAD LOSS WATTS 75 C	% IMP. 75 C	LOAD LOSS WATTS 75 C	% IMP. 75 C
						230770	6.19		10.39		13.87
AVERAGE											
GUARANTEE				98000	0.6		6.20				
Total Loss Watts at 35 C				AVERAGE		320220					
				GUARANTEE		335000					
EFFICIENCIES AT 35C 100% P.F.					REGULATION AT 35C						
	Load	Full Load	1/2 Load	1/3 Load	1/4 Load	AVERAGE	100% P.F.	90% P.F.	80% P.F.	70% P.F.	
AVERAGE		99.72	99.74	99.73	99.62	AVERAGE	0.383	3.02	3.98		
GUARANTEE		99.72	99.74	99.74	99.63	GUARANTEE	0.4	-	4.0		

### TEMPERATURE RISE (Serial No. \_\_\_\_\_)

Average ultimate temperature rise in deg C corrected to instant of shutdown

		H - Winding		X - Winding		Y - Winding			
Winding Connection		223000	V.	61275	V.	13800	Y.	Method of cooling:	OA
MVA	Amp.	120	311	120	1116	29	1813	Top oil rise:	56.4 C
Riser Test	Guar.	58.7 C	65 C	59.3 C	65 C	62.8 C	65 C	Ambient:	25.0 C
Winding Temp. ind.		deg C		deg C		deg C			
Winding Connection		223000	Y.	21275	V.	13800	V.	Method of cooling:	FOA
MVA	Amp.	200	518	200	1874	48.3	2030	Top oil rise:	59.7 C
Riser Test	Guar.	59.0 C	65 C	61.5 C	65 C	57.1 C	65 C	Ambient:	25.0 C
Winding Temp. ind.		deg C		deg C		deg C			

### DIELECTRIC TESTS

APPLIED POTENTIAL TEST	VOLTAGE OF WINDING TESTED	TEST VOLTAGE APPLIED	DURATION IN SECONDS
Voltage applied to each winding in turn with all other windings connected to core and ground.	H	50000	30 seconds for all tests
Line Terminal to Ground	X	50000	
	Y	74000	

Induced voltage test  $\frac{1}{2}$  KV/RY ~~120000/160000/200000~~ for 7200 cycles

POWER TRANSFORMER DEPARTMENT  
**GENERAL ELECTRIC**  
 PITTSFIELD, MASS.

Additional Test Data

Additional Resistances @ 75°C

Connection	Test
75900Y	.1844
62100Y	.1860
Ser. U Exc. Wdg.	.9860

Insulation Power Factor Tests

H & X - Grd.	Y - Grd.	Temp. °C
0.20	0.22	22.0

Tap Impedances

Connection	KVA	% Volts	Watts	Temp. °C
223000Y-75900Y	120000	6.47	191400	23.6
223000Y-62100Y	120000	6.03	244800	23.7
75900Y-13800	29000	13.92	141100	25.5
62100Y-13800	29000	13.43	142900	25.6

Voltage Ratios

Connection	Calculated	Test		
		Phase 1	Phase 2	Phase 3
223000-75965	2.9356	2.9337	2.9367	2.9375
223000-75550	2.9517	2.9510	2.9533	2.9548
223000-75125	2.9684	2.9665	2.9695	2.9703
223000-74705	2.9851	2.9843	2.9867	2.9882
223000-74280	3.0021	3.0003	3.0033	3.0042
223000-73850	3.0196	3.0188	3.0218	3.0227
223000-73420	3.0373	3.0363	3.0393	3.0402
223000-72985	3.0554	3.0549	3.0580	3.0589
223000-72550	3.0737	3.0727	3.0758	3.0763
223000-72110	3.0925	3.0921	3.0949	3.0962
223000-71670	3.1115	3.1101	3.1129	3.1139
223000-71225	3.1309	3.1307	3.1335	3.1348
223000-70780	3.1506	3.1493	3.1522	3.1535
223000-70330	3.1708	3.1705	3.1733	3.1746
223000-69880	3.1912	3.1899	3.1926	3.1940
223000-69475	3.2121	3.2115	3.2147	3.2160
223000-69000	3.2319	3.2319	3.2349	3.2361
223000-68510	3.2550	3.2546	3.2578	3.2589
223000-68050	3.2770	3.2757	3.2790	3.2803
223000-67275	3.3393	3.3387	3.3419	3.3432
223000-13800	16.1534	16.1865	16.2008	16.2190
69000-13800	5.9900	5.9911	5.9950	5.9962

POWER TRANSFORMER DEPARTMENT

GENERAL  ELECTRIC

PITTSFIELD, MASS.

To check the calibration of the winding temperature indicators the following information may be used.

<u>CT</u>	<u>Current To Apply For 30 Minutes</u>	<u>Terminals</u>	<u>Rise Over 25°C Oil</u>	<u>Resistance(Ohms)</u>
A	32.4	X1 - Xo G	39.5	.170
B	32.0	X2 - Xo G	40.1	.070
C	30.3	X3 - Xo G	39.1	.170

These values will be approximately 3°C higher in 0°C top oil and 3°C lower in 50°C top oil. The resistors should be in place for all tests.

# GENERAL ELECTRIC

## AUTOTRANSFORMER



CLASS 0A/FA/FOA THREE-PHASE 60 HERTZ

VOLTAGE RATING: 2200-NGR, V/18750-61000-0-6A, V/1940-19800  
 KVA RATING: 120000 (OUTPUT) CONTINUOUS 65 C RISE SELF-COOLED  
 KVA RATING: 180000 (OUTPUT) CONTINUOUS 65 C RISE FORCED-AIR-COOLED  
 KVA RATING: 200000 (OUTPUT) CONTINUOUS 65 C RISE FORCED-OIL AND FORCED-AIR-COOLED

LINE TO	LINE RAMP	LINE TO	LINE RAMP	LINE TO	LINE RAMP
2200	1970	18750	1940	19800	19800
18750	1529	18750	1529	18750	1529
18750	1529	18750	1529	18750	1529
18750	1529	18750	1529	18750	1529
18750	1529	18750	1529	18750	1529
18750	1529	18750	1529	18750	1529
18750	1529	18750	1529	18750	1529
18750	1529	18750	1529	18750	1529
18750	1529	18750	1529	18750	1529
18750	1529	18750	1529	18750	1529

LINE TO	LINE RAMP	LINE TO	LINE RAMP
2200	1970	18750	1940
18750	1529	18750	1529
18750	1529	18750	1529
18750	1529	18750	1529
18750	1529	18750	1529
18750	1529	18750	1529
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18750	1529	18750	1529
18750	1529	18750	1529
18750	1529	18750	1529

LINE TO	LINE RAMP	LINE TO	LINE RAMP
2200	1970	18750	1940
18750	1529	18750	1529
18750	1529	18750	1529
18750	1529	18750	1529
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18750	1529	18750	1529
18750	1529	18750	1529

LINE TO	LINE RAMP	LINE TO	LINE RAMP
2200	1970	18750	1940
18750	1529	18750	1529
18750	1529	18750	1529
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18750	1529	18750	1529

LINE TO	LINE RAMP	LINE TO	LINE RAMP
2200	1970	18750	1940
18750	1529	18750	1529
18750	1529	18750	1529
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LINE TO	LINE RAMP	LINE TO	LINE RAMP
2200	1970	18750	1940
18750	1529	18750	1529
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LINE TO	LINE RAMP	LINE TO	LINE RAMP
2200	1970	18750	1940
18750	1529	18750	1529
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18750	1529	18750	1529

LINE TO	LINE RAMP	LINE TO	LINE RAMP
2200	1970	18750	1940
18750	1529	18750	1529
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18750	1529	18750	1529

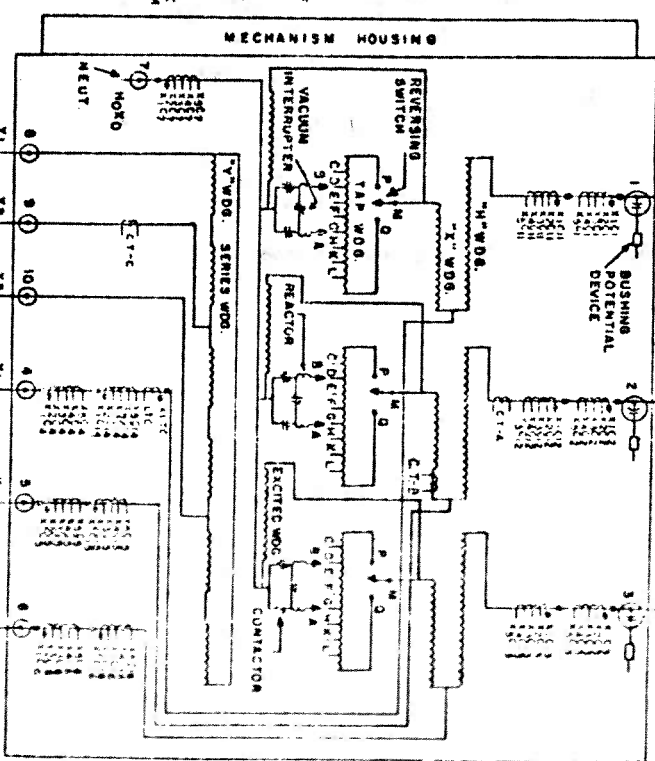
LINE TO	LINE RAMP	LINE TO	LINE RAMP
2200	1970	18750	1940
18750	1529	18750	1529
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18750	1529	18750	1529
18750	1529	18750	1529

LINE TO	LINE RAMP	LINE TO	LINE RAMP
2200	1970	18750	1940
18750	1529	18750	1529
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18750	1529	18750	1529
18750	1529	18750	1529
18750	1529	18750	1529

PER CENT 2200000 V 400000 V VOLTS AT 120000 KVA  
 PER CENT 2200000 V 1350 VOLTS AT 7000 KVA  
 PER CENT 2200000 V 1100 VOLTS AT 7000 KVA  
 PER CENT 2200000 V 1100 VOLTS AT 7000 KVA

PER CENT 2200000 V 400000 V VOLTS AT 120000 KVA  
 PER CENT 2200000 V 1350 VOLTS AT 7000 KVA  
 PER CENT 2200000 V 1100 VOLTS AT 7000 KVA  
 PER CENT 2200000 V 1100 VOLTS AT 7000 KVA

PER CENT 2200000 V 400000 V VOLTS AT 120000 KVA  
 PER CENT 2200000 V 1350 VOLTS AT 7000 KVA  
 PER CENT 2200000 V 1100 VOLTS AT 7000 KVA  
 PER CENT 2200000 V 1100 VOLTS AT 7000 KVA



APPROX WEIGHTS IN POUNDS  
 1750 434.000  
 1750 97.200  
 1750 117.000  
 1750 146.500  
 1750 57.000

WINDING UNWINDING  
 TAP AND FITTINGS 117.000  
 MAIN TANK AND IOCC CON 146.500  
 MECH HOUS 400.000  
 507.000

APPROX WEIGHTS IN POUNDS  
 1750 434.000  
 1750 97.200  
 1750 117.000  
 1750 146.500  
 1750 57.000

WINDING UNWINDING  
 TAP AND FITTINGS 117.000  
 MAIN TANK AND IOCC CON 146.500  
 MECH HOUS 400.000  
 507.000