



SOCIETA' ELETTROMECCANICA ARZIGNANESE S.P.A.

Transformer Test Certificate

TEST ACCORDING TO : I.E.C. 60076-11 / 2004 - DRY-TYPE TRANSFORMERS
C.E.I. 14-8 ANNO 1999 - TRASFORMATORI DI POTENZA A SECCO

CERTIFICATE N° 84270 Testing Date : 12/12/2005 Page 1

ORDER N° : (ns. VEN001933)
CUSTOMER : SENERJI MUHENDISLIK LTD -TURKEY-

Transformer type : ENCAPSULATED-WINDING DRY-TYPE TRANSFORMER Type : TTR - D
POWER : 1000.0 kVA SERIAL N° : 84270 Phase: 3 Frequency= 50 Hz
VOLTAGE RATIO : 34500 +1-4x1500V / 400 Volt
CURRENT RATIO : 16.730 / 1443.380 Ampere
CONNECTION : Dyn11 GROUP : 11

Measurements Summary

GUARANTEED RATIO : 34500/400 V

	NO LOAD LOSSES (Watt)	NO LOAD CURRENT(%)	LOAD LOSSES (Watt)	IMPEDANCE (%)
GUARANTEED VALUES	3100.0	1.4000	10000	6.0000
TOLLERANCE (%)	15.000	30.000	15.000	10.000
MEASURED VALUES	2892.3	0.40535	9065.6	5.8095
DIFFERENCE (%)	-6.7006	-71.047	-9.3442	-3.1757

REMARK CLASSES : E2 - C2 - F1
TEMPERATURE MONITORING UNIT MOD. T-154 n° T4265C028/8

DIELECTRIC TESTS

SEPARATE-SOURCE VOLTAGE WITHSTAND TEST

Highest voltage = 36 kV Testing voltage= 70 kV t = 60 sec. Result : SATISFACTORY

SEPARATE-SOURCE VOLTAGE WITHSTAND TEST

Highest voltage = 1.1 kV Testing voltage= 3 kV t = 60 sec. Result : SATISFACTORY

INDUCED OVERVOLTAGE WITHSTAND TEST

Supplied Voltage = 0.8 kV f= 150 Hz t= 40 sec Supplied side: L.V. Result : SATISFACTORY

MEASUREMENT OF NO-LOAD LOSSES AND CURRENT

SUPPLIED WINDING: 400 V FREQUENCY: 50.000 Hz

VOLTAGE K = 1					CURRENT K = 1				POWER K = 1				
VMuv	VMuw	VMvw	VMm	Vm(rms)	Iu	Iv	Iw	Aver. I	Wu	Wv	Ww	W tot	W corr.
401.84	401.66	399.93	401.14	400.85	6.5900	4.7440	6.2180	5.8507	966.20	741.20	1182.8	2890.2	2892.3

REMARK

CUSTOMER MANUFACTURER per **S.E.A. S.p.A.**
TEZZE DI ARZIGNANO (VI)

Company Having Certified Quality System from DNV ITALY According to UNI EN ISO 9001



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TRANSFORMER TYPE: ENCAPSULATED-WINDING DRY-TYPE TRANSFORMER

TYPE: TTR - D

RATING: 1000.0 kVA

SERIAL N° 84270

Phase : 3

Frequency= 50 Hz

MEASUREMENT OF VOLTAGE RATIO

METHOD: Barbagelata

MEASURE ON RATIO :

34500/400 Volt

TAP-CHANGER POSITION	MEASURED RATIO			NOMINAL RATIO	DIFFERENCE (%)
	1U1V/2U2N	1V1W/2V2N	1W1U/2W2N		
5-6/5-6/4-5	123.400	123.400	123.400	123.409	-0.007
5-6/4-5/4-5	129.900	129.900	129.900	129.904	-0.003
4-5/4-5/4-5	136.300	136.300	136.300	136.399	-0.073
4-5/4-5/3-4	142.800	142.800	142.800	142.894	-0.066
4-5/3-4/3-4	149.300	149.300	149.300	149.389	-0.060
3-4/3-4/3-4	155.800	155.800	155.800	155.885	-0.055

REMARK

MEASUREMENT OF WINDINGS RESISTANCE

METHOD: VOLT-AND-AMMETER

Amb. Temp.= 17.0 °C

PRIMARY WINDING :

34500 V

SECONDARY WINDING :

400 V

TERMINALS	PRIMARY WINDING			SECONDARY WINDING			REMARKS
	V (Volt)	I (Amp)	R (Ohm)	TERMINALS	V (Volt)	I (Amp)	
1U1V	9.2750	1.0000	9.2750	2U2V	0.039930	50.000	0.00079860
1V1W	9.2690	1.0000	9.2690	2V2W	0.041270	50.000	0.00082540
1W1U	9.2630	1.0000	9.2630	2W2U	0.039850	50.000	0.00079700
Average Resistance			9.2690 Ohm	Average Resistance			0.00080700 Ohm
Average resistance 75 °C			11.490 Ohm	Average resistance 75 °C			0.0010004 Ohm

MEASUREMENT OF IMPEDANCE AND LOAD LOSS

Energized winding :

34500 V

Frequency: 50.000 Hz

Ambient Temperature= 17.0 °C

VOLTAGE K=1				CURRENT K=1				POWER K=1			
Vuv	Vuw	Vvw	Vm	Iu	Iv	Iw	Im	Wu	Wv	Ww	WM
1264.1	1258.0	1262.8	1261.6	10.585	10.570	10.548	10.568	1023.4	1039.6	1045.2	3108.2
Voltage at In (V) : 1997.9				Nominal current: 16.735 A				Losses at In (W) : 7794.6			

CALCULATION OF LOAD LOSSES AND IMPEDANCE

Ratio: 34500/400 V

Primary winding in:

ALLUMINIUM

Secondary winding in:

ALLUMINIUM

Ambient Temperature:	17.0 °C	Reference Temperature =	75 °C	Coefficient K=	1.240
Prim. wind. resistance:	9.2690 Ohm	Total ohmic losses:	7953.2	Watt	
Secon. wind. resistance:	0.00080700 Ohm	Additional losses:	1112.4	Watt	
Prim. wind. ohmic losses :	3893.7	Total load losses:	9065.6	Watt	
Secon. wind. ohmic losses :	2521.9	Inductive component Xi:	5.7383	%	
Total ohmic losses :	6415.6	Resistive component Ri:	0.90656	%	
Load losses:	7794.6	Impedance:	5.8095	%	
Additional losses:	1379.0	Power factor :	0.15605		

VOLTAGE DROP (%)

LOAD	Cosfi=0.8	Cosfi=1
1/1	4.2501	1.0712
3/4	3.1722	0.77253
1/2	2.1046	0.49444

EFFICIENCY (%)

LOAD	Cosfi=0.8	Cosfi=1
1/1	98.527	98.818
3/4	98.686	98.946
1/2	98.727	98.979

CUSTOMER

MANUFACTURER

per S.E.A. S.p.A.
TEZZE DI ARZIGNANO (VI)

SEA SOCIETA' Elettromeccanica ARZIGNANESE S.P.A.

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