

SYNCHRONOUS GENERATOR 3 PHASES				TEST REPORT	
CLIENT:	DRESSER-RAND NADROWSKI – ITALIA			Order – No.	C.5004410
Type:	BZK-630-S/4	Service:	S-1	Serial Number:	4010000042
Voltage (V):	3300	Insulation-class:	F	Type of Constr.:	IM-1001
Current (A):	625,5	Thermal-class used:	F	Type of Protec.:	IP-44R
Power (KVA):	3575	Water Temp Max (°C)	---	Type of Cooling:	IC-31
Cos Phi:	0.80	Ambient Temp. (°C):	40 °C	Machine Weight (Tn):	10.5
Frequency (Hz):	50	Heater	2 X 600 W – 230 V		
Speed (rpm):	1500	OIL	VERKOL ASTURUS 3		
Sense Of Rotation:	DCHA.	Bearing D.E.	156 gr.	LUBRICATION	
Exc.-Voltage (V):	45	Bearing N.D.E.	130 gr.	Every 1900 hours	
Exc.-Current (A):	5.4	Water flow:		Every 2460 hours	
Regulator:	BASLER DECS-100				

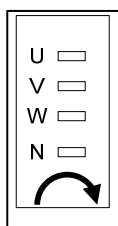
1. MEASUREMENT OF RESISTANCES

RESISTANCE OF WINDINGS						
	Ambient Temperature	U-V	V-W	W-U	ROTOR (J-K)	EXCITER (J'-K')
COLD	16.4 °C	32.30 mΩ	32.10 mΩ	32.37 mΩ	356 mΩ	6.63 Ω

2. MEASUREMENT OF INSULATION RESISTANCES

MEASURING OF INSULATION RESISTANCE (COLD)					
	Ambient Temp.	Test Voltage	1 Minute	10 Minutes	Capacity
STATOR Total	19.2 °C	5000 V	7730 MΩ	35680 MΩ	0.145 μF
STATOR phase per phase		5000 V	U= 13770 MΩ V= 14440 MΩ W= 15170 MΩ	---	---
ROTOR		500 V	44100 MΩ	176600 MΩ	0.090 μF
EXCITER		500 V	184100 MΩ	---	0.002 μF

3. PHASE SEQUENCE AND ROTATION SENSE → OK



4. MEASUREMENT OF REMAINING VOLTAGE

VOLTAGE (V)	SPEED (RPM)	F (Hz)
107	1500	50

5. NO LOAD TEST

VOLTAGE	R.P.M.	F (Hz)	V _{EXC.} (V)	I _{EXC.} (A)	Windings Temp (°C)	V _{ROTOR}
906	1500	50	2.26	0.31	25.5	5.9
1481	1500	50	3.92	0.54	26.0	9.8
1982	1500	50	5.45	0.75	26.3	13.3
2405	1500	50	6.83	0.94	26.5	16.4
2996	1500	50	9.12	1.26	26.6	21.7
3302	1500	50	10.9	1.51	26.5	25.7
3540	1500	50	13.1	1.80	26.3	30.5
3966	1500	50	19.0	2.62	25.8	43.5

6. NO LOAD HEATRUN.

TIME						EXCITER		WINDINGS of STATOR						BEARING			WATER	
	rpm	Hz	V	I	V _{ROT}	V _{EXC.}	I _{EXC.}	U ₁	U ₂	V ₁	V ₂	W ₁	W ₂	DE	NDE1	NDE2	IN	OUT
21:45	1500	50	3297	---	25.6	11.6	1.61	16.7	16.2	17.0	16.5	16.5	16.5	17.6	19.3	19.3	15.2	17.5
22:45	1500	50	3320	---	26.5	12.0	1.65	26.8	26.4	26.6	26.6	26.1	26.4	31.1	26.1	26.0	14.8	20.2
23:45	1500	50	3323	---	26.5	12.0	1.65	27.0	26.5	26.7	26.8	26.3	26.6	34.6	25.0	25.0	14.1	20.0
0:45	1500	50	3313	---	26.4	11.9	1.64	26.7	26.2	26.3	26.5	25.9	26.2	34.5	22.8	22.8	13.2	20.3
1:15	1500	50	3314	---	26.3	11.9	1.64	26.7	26.2	26.3	26.4	25.9	26.2	35.0	22.2	22.1	14.0	19.7

7. MEASUREMENT OF RESISTANCES (No load heatrun)

RESISTANCE OF WINDINGS						
	Reference Temp.	U-V	V-W	W-U	ROTOR (J-K)	EXCITER (J'-K')
COLD	16.4 °C	32.30 mΩ	32.10 mΩ	32.37 mΩ	356 mΩ	6.63 Ω
HOT	14.0 °C	33.30mΩ	---	---	372 mΩ	---

8. TEMPERATURE RISE (No load heatrun): All values referred to cold AIR temperature

	WINDINGS	
	STATOR	ROTOR
PT-100	12.7 K	---
Resistance	10.2 K	13.7 K

9. SHORT-CIRCUIT TEST

% CURRENT	CURRENT (A)	R.P.M.	F (Hz)	V _{EXC.} (V)	I _{EXC.} (A)	Windings Temp (°C)	V _{ROTOR}
125	748.0	1500	50	33.8	4.65	28.2	16.8
100	628.0	1500	50	28.5	3.91	32.4	34.2
75	467.0	1500	50	21.0	2.88	34.0	51.1
50	313.6	1500	50	13.8	1.90	34.1	68.1
25	155.6	1500	50	6.5	0.89	32.7	79.4

10. SHORT-CIRCUIT HEATRUN.

TIME						EXCITER		WINDINGS of STATOR						BEARING			WATER	
	rpm	Hz	V	I	V _{ROT}	V _{EXC.}	I _{EXC.}	U ₁	U ₂	V ₁	V ₂	W ₁	W ₂	DE	NDE1	NDE 2	IN	OUT
2:30	1500	50	---	628	68.1	28.5	3.91	28.4	27.3	27.9	27.6	27.9	28.1	30.0	20.9	20.9	13.1	19.3
3:30	1500	50	---	620	72.8	29.9	4.08	46.5	45.3	44.7	45.3	45.4	45.9	33.5	22.8	22.8	14.3	21.8
4:30	1500	50	---	627	73.7	30.4	4.12	47.6	46.2	46.9	46.1	46.3	46.8	36.4	23.7	23.7	13.9	21.7
5:00	1500	50	---	626	73.6	30.4	4.12	47.6	46.2	46.9	46.1	46.3	46.8	36.7	23.9	23.9	14.2	21.6
5:30	1500	50	---	625	73.6	30.4	4.12	47.6	46.2	46.9	46.2	46.3	46.9	36.9	24.0	24.0	14.7	21.6
Tecnichal problems. The heatrun is stopped and restart again 15 minutes later.																		
5:45	1500	50	---	625	73.9	31.0	4.15	42.8	40.0	42.6	40.0	40.0	42.0	36.2	23.7	23.8	14.1	21.0
6:15	1500	50	---	624	73.8	31.1	4.14	47.7	46.3	47.2	46.3	46.4	47.0	36.5	23.8	23.8	15.0	21.4
6:45	1500	50	---	624	73.8	31.1	4.14	47.7	46.3	47.1	46.3	46.3	47.0	36.5	23.8	23.8	15.5	22.0

11. MEASUREMENT OF RESISTANCES (Short-Circuit Heatrun)

RESISTANCE OF WINDINGS						
	Reference Temp.	U-V	V-W	W-U	ROTOR (J-K)	EXCITER (J'-K')
COLD	16.4 °C	32.30 mΩ	32.10 mΩ	32.37 mΩ	356 mΩ	6.63 Ω
HOT	15.5 °C	36.50 mΩ	---	---	410 mΩ	6.83 Ω

12. TEMPERATURE RISE (Short-Circuit Heatrun): All values referred to cold AIR temperature

	WINDINGS		
	STATOR	ROTOR	EXCITER
PT-100	32.2 K	---	---
Resistance	33.6 K	39.0 K	8.5 K

13. OVERSPEED TEST

OVERSPEED TEST: 1800 RPM DURING 2 MINUTES			
	BEARINGS (°C)		
	DE	NDE 1	NDE 2
BEFORE	31.1	21.1	21.2
AFTER	31.0	21.2	21.2

14. HIGH VOLTAGE TEST

HIGH VOLTAGE TEST				OK
STATOR (phase per phase)	7600 V	50 Hz	DURING 60 SECONDS	OK
ROTOR	1500 V	50 Hz	DURING 60 SECONDS	OK
EXCITER	1500 V	50 Hz	DURING 60 SECONDS	OK
HEATER	1500 V	50 Hz	DURING 60 SECONDS	OK

15. MEASUREMENT OF INSULATION RESISTANCES

MEASURING OF INSULATION RESISTANCE (COLD)					
	Ambient Temp.	Test Voltage	1 Minute	10 Minutes	Capacity
STATOR Total	19.2 °C	5000 V	7730 MΩ	35680 MΩ	0.145 μF
ROTOR		500 V	44100 MΩ	176600 MΩ	0.090 μF
EXCITER		500 V	184100 MΩ	---	0.002 μF
MEASURING OF INSULATION RESISTANCE (AFTER HIGH VOLTAGE TEST)					
	Windings Temp.	Test Voltage	1 Minute	10 Minutes	Capacity
STATOR Total	32.0 °C	5000 V	5252	---	0.149 μF
STATOR Phase per Phase		5000 V	U=12020 V=10490 W=11980	---	0.050 μF
ROTOR		500 V	28240 MΩ	---	0.092 μF
EXCITER		500 V	355400 MΩ	---	0.002 μF
Heaters		500 V	265.3Ω/355.2Ω	---	---

16. TEST OF AUXILIARY ELEMENTS

ELEMENT	QUANT.	STATUS	POWER / CONSUMPTION
Pt-100	6X2+2	OK	---
Heaters	2	OK	230V / 600 W (90.8 / 86.3)
Regulator DECS-100	1	OK	---

REMARKS:

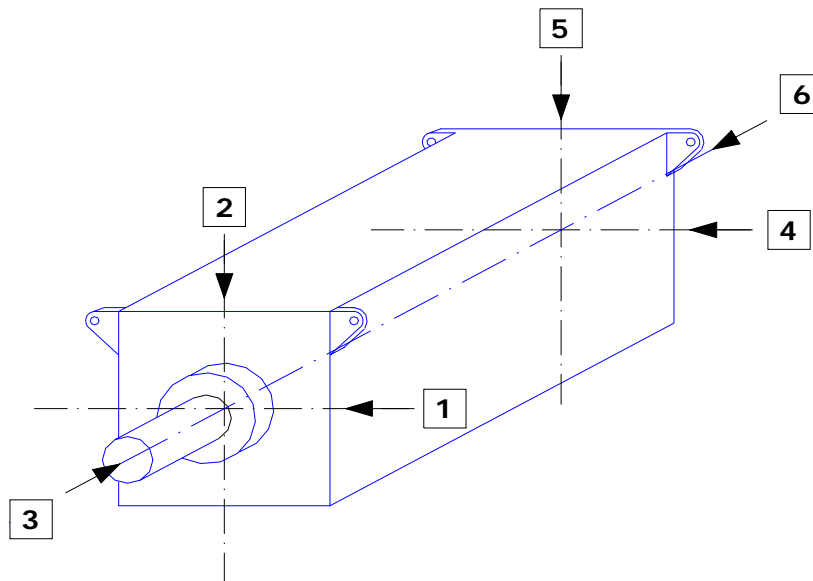
MACHINE N.: 4010000042

Checked by: Mikel Rodrigo

Technician Number: 735

Date and Signature: 13/12/2007

17. VIBRATIONS LEVEL MEASUREMENT



	Machine at 1500 rpm Before Overspeed test	Machine at 1500 rpm After Overspeed test
POINTS OF MEASUREMENT	Speed of Vibration mm/seg (RMS)	Speed of Vibration mm/seg (RMS)
1. Horizontal D.E.	0.4	0.4
2. Vertical D.E.	0.3	0.5
3. Axial D.E.	1.1	1.0
4. Horizontal N.D.E.	0.4	0.4
5. Vertical N.D.E.	0.4	0.4
6. Axial N.D.E.	0.4	0.5

Instrument: SKF MICROLOG CMVA55

Serial Number: 553354

S/N: E2050/003

REMARKS:

Machine at noad and rated voltage and frecueny.

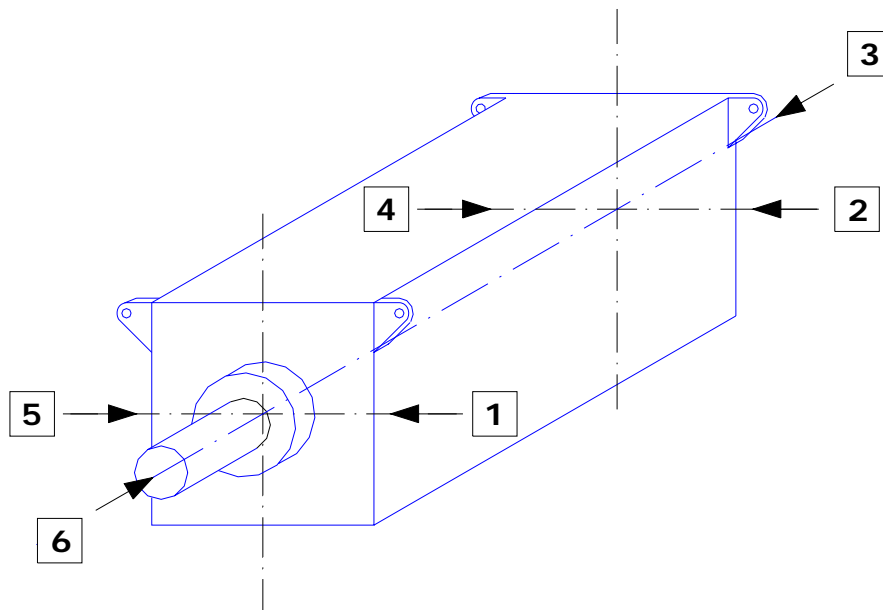
MACHINE No.: 4010000042

Checked by: Roberto Renilla

Technician Number: 2401

Date and Signature: 13/12/2007

18. NOISE LEVEL MEASURENT



Recommended measuring points

Distances = 1m

POINTS OF MEASURING	Machine at 1500 rpm	
	Measured Level (dBA))	Background Level (dBA)
1.Horizontal Right side D.E.	91.1	75.6
2.Horizontal Right side N.D.E.	89.7	
3.Axial N.D.E.	90.8	
4.Horizontal Left side N.D.E.	89.5	
5.Horizontal Left side D.E.	90.2	
6.Axial D.E.	91.3	

Measuring instruments: DAWE tipo D-1422C

Serie N.: 2/10124337

STANDARDS: VDE 0530-9/98 (DIN-EN-60034/09-98)

CEI 60034 – 9/08-97 (Sonus Pressure Level)

REMARKS:

Machine at no load and rated voltage and frequency.

MACHINE No.: 4010000042

Checked by: Roberto Renilla

Technician Number: 2401

Date and Signature: 13/12/2007